the OIL AND GAS JOURNAL

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nother first in engineering kill and high uality . . . the new BJ POWAIRMATIC tubing tong

ST POWERFUL. A 5.3 hp vane-type air motor drives the new Powairmatic Tubing Tong through a two-speed transmission d chain drive. The motor, largest of its type available, and efficient drive assembly make the Powairmatic Tubing Tong most efficient and powerful power tong on the market.

HER UNIFORM TORQUE. There's no guessing with the Powairtic. The motor drives the tool at 16 rpm in low gear . . . velops over 3980 ft lbs of torque at 90 psi for positive "make-" or "break-out."

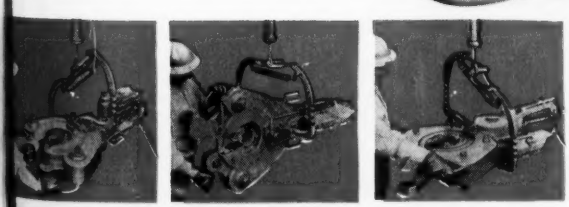
STER "SPINNING-UP". Wells get back in production much ster with the Powairmatic. Time is saved. Money is saved. e element of fatigue is reduced. "Spinning-up" in high ar at 60 rpm with 1062 ft lbs of torque, the new Powairmatic Tubing Tong saves up to 20 inutes per round-trip on short strings!

ST VERSATILE. There's no throttle guesswork align the jaw openings. More time is saved the Powairmatic with its automatic positioning valve and cam which aligns automatically for swinging on and off the pe. Ideal for wet jobs. A spring-cked roll-over hanger provides instant reversal of the Tong . . . no awkward moves . . . no necessity to disconnect any parts. Easy reversal of the Powairmat adds convenience to testing for collar or tubing leaks.

Can be used as a light rotary table. For drilling rathole Clean-out work. Inside cutting. For any light job . . . the desig of the API chain drive and proper positioning of the high-qua ity bearings and sprockets maintain constant rotating spee

OIL BATH LUBRICATION. Transmission and drive are enclose in an oil bath, assuring proper lubrication for high-spee rotating parts. Standard alemite fittings for all other lubr cation points.

INTERCHANGEABLE JAWS. Separate jaws and bushing are provided for tubing or dri pipe from 2" through 3½" O.D Simple removal of one pi permits exchange of jaw and bushings. Full-length dies eliminate wobble an insure uniform grip with out slipping or crimping Write for complete infor mation on the new BJ Pow airmatic Tubing Tong. Th Powairmatic is availabl now.



To reverse the tong, just roll it over.

BJ MEANS ENGINEERED OIL TOOLS

Byron Jackson Co.

Since 1872

MAIN OFFICE AND PLANT, LOS ANGELES 54, CALIF.

Mid-Continent Office and Plant, Houston 1, Texas
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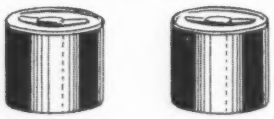
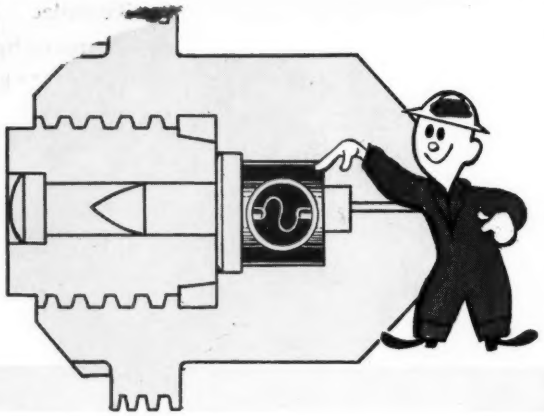
FULL PENETRATION CALLS FOR

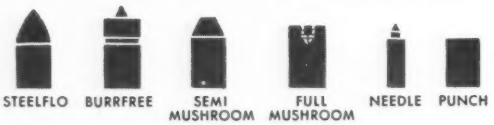
THE RIGHT POWDER CHARGE



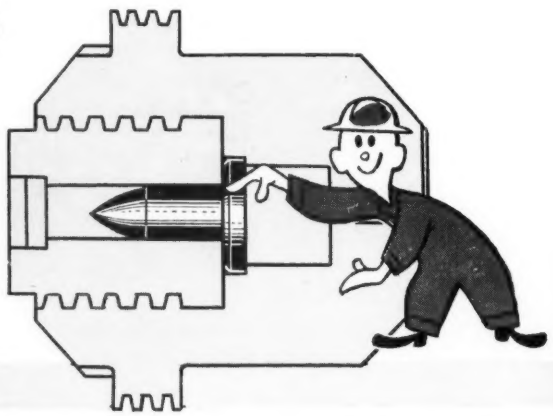
The balanced powder charge in Lane-Wells Gun Perforator is packed to the proper density to give maximum velocity to the bullet.



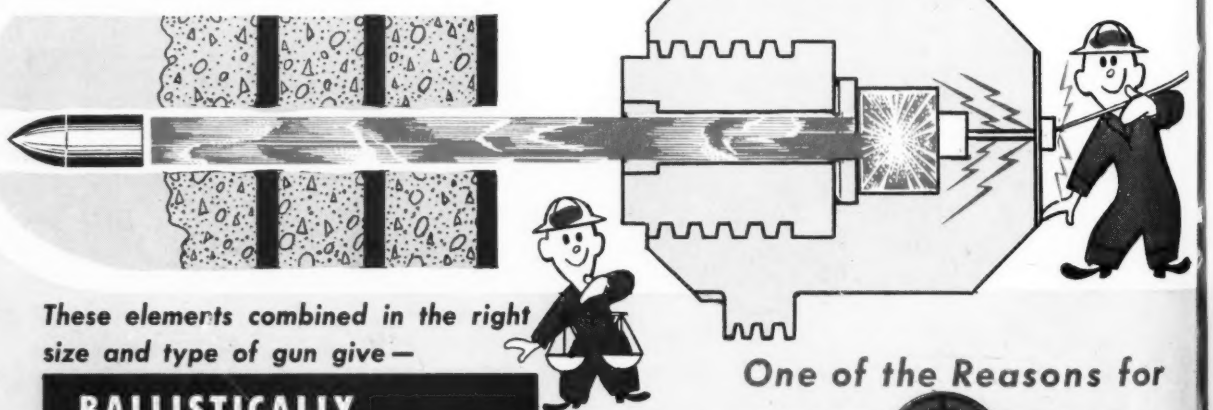
DRIVING THE RIGHT BULLET



Each Lane-Wells bullet is designed to do one job best. You name the conditions and one of the Lane-Wells bullets will get the best results.



IN THE RIGHT GUN!



These elements combined in the right size and type of gun give—

BALLISTICALLY BALANCED DESIGN

One of the Reasons for

LANE WELLS

BETTER PERFORATING

SANGELES • HOUSTON • OKLAHOMA CITY
General Offices, Export Offices and Plant
610 S. SOTO ST., LOS ANGELES 11, CALIFORNIA

LANE WELLS SERVICE AND PRODUCTS ARE AVAILABLE THRU PETRO TECH SERVICE CO. IN VENEZUELA

Inhibit Bearing Corrosion *Effectively*

Use Du Pont "Ortholeum" 202

Reg. U. S. Patent Office

If you have a bearing corrosion problem with solvent extracted motor oils, "Ortholeum" 202 Lubricant Assistant may be the answer. A sulfurized hydrocarbon in which sulfur activity is carefully controlled, "Ortholeum" 202 imparted its corrosion inhibiting effectiveness in solvent extracted mid-continent stocks. It also has good E. P. properties. These, along with its sulfur activity, suggest the possible use as an additive for gear oils and cutting oils as well.

Ample Quantities are now available. Samples are also available for experimentation. Write the nearest District Office for samples and also for Technical Bulletin on Du Pont "Ortholeum" 202.

TYPICAL PROPERTIES OF "ORTHOLEUM" 202

DESCRIPTION: A viscous, clear, amber-colored liquid with a terpenic odor.

Specific Gravity, 60°/60°F.	1.14
Color, N.P.A.	4
Viscosity at 210°F., S.U.S.	110
Pour Point °F	+35
Flash Point, °F. (C.O.C.)	235
Fire Point, °F. (C.O.C.)	255
Ash	Trace
Miscibility in Oil at room temperature	in all proportions
Sulfur, %	35

SULFUR ACTIVITY, COPPER STRIP*

3 HOURS AT 210° F.	
0.5%	Light to Medium Brown
5.0%	Black
1 HOUR AT 250° F.	
0.5%	Medium Brown
2.5%	Black
1 HOUR AT 300° F.	
0.5%	Dark Brown
2.5%	Black

*VV-L-791c, Method 530.31, except for variations in time and temperature as noted.

- *Gasoline Oxidation Inhibitors*
- *Tetraethyl Lead Compounds*
- *Lubricating Oil Additives*
- *Fuel Oil Additives*
- *Gasoline Dyes*

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. . . THROUGH CHEMISTRY

DU PONT
PETROLEUM CHEMICALS

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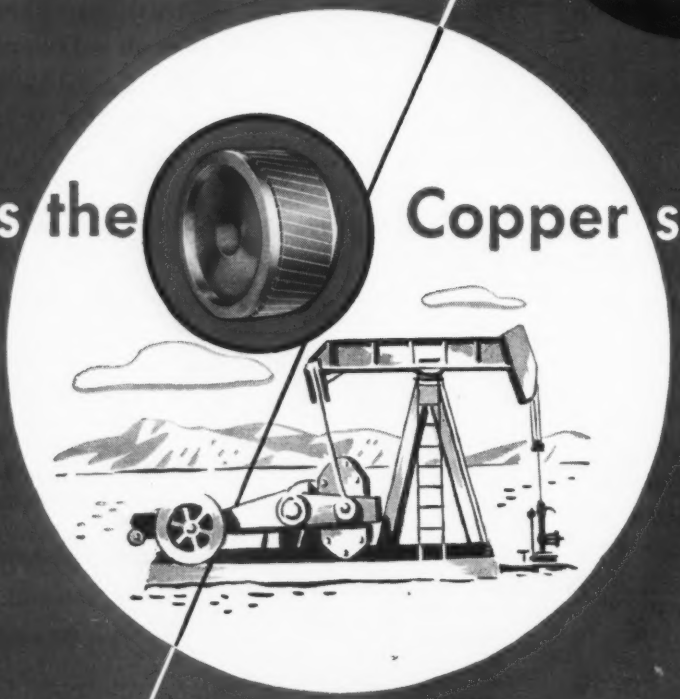
DISTRICT OFFICES: WILMINGTON, DEL. • CHICAGO, ILL. • TULSA, OKLA. • HOUSTON, TEXAS • LOS ANGELES, CALIF.

only the QZK

has the

Copper spun Rotor!



When it comes to motors . . .

. . . the one-piece, indestructible rotor that assures the ability to stand up under the heavy starting loads . . . the strains of peak capacity operation for long periods found in pumping rig service. The Fairbanks-Morse QZK polyphase, squirrel cage protected frame motor is designed for durability . . . to provide true dependability, smooth, quiet operation for every pumping application. Fairbanks, Morse & Co., Chicago 5, Illinois.

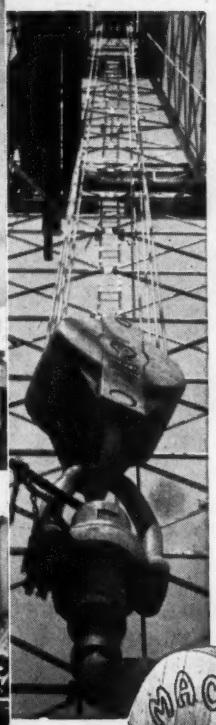
FAIRBANKS-MORSE

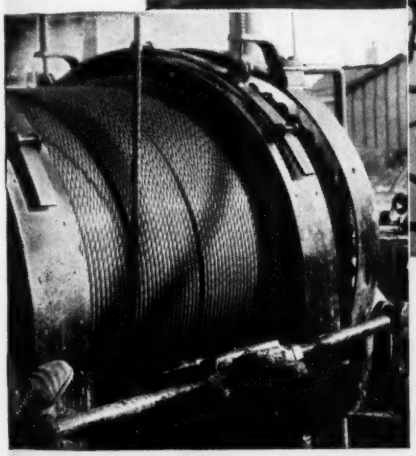
A name worth remembering

OIL FIELD EQUIPMENT • DIESEL ENGINES
DIESEL LOCOMOTIVES • PUMPS
SCALES • MOTORS • FARM EQUIPMENT
RAILROAD MOTOR CARS and STANDPIPES
GENERATORS • STOKERS • MAGNETOS

Macwhyte PREformed Rotary Lines

Correct for your drilling equipment





For maximum safety, service, dependability, use Macwhyte PREformed Monarch Whyte Strand Rotary Lines.

It's PREformed for flexibility, easy handling and maximum service. It runs smoothly through blocks and spools evenly on drum.

Internal Lubrication covers every wire in the line . . . protecting unseen inside wires. Monarch Whyte Strand PREformed Rotary Lines are available in the size and length you need. Macwhyte Distributors and Mill Depots — carry stocks for immediate delivery. Macwhyte representatives will recommend the correct line for your equipment.

MACWHYTE COMPANY

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Manufacturers of Internally Lubricated Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies.

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Other Macwhyte Wire Lines for the oil industry:

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Braided Wire Rope Slings
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Your choice of Streamliner service between Chicago and the PACIFIC COAST

Union Pacific's daily Streamliners provide splendid accommodations for both Pullman and Coach passengers. Superb Dining-car meals . . . restful Club and Lounge cars . . . and a smooth roadbed add to the pleasure of your journey—from beginning to end.

Streamliner **"CITY OF LOS ANGELES"**
Between Chicago-Los Angeles

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Road of the Streamliners

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LINK-BELT CHAINS ARE READY NOW!

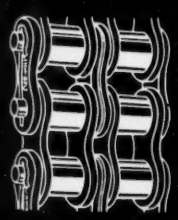
How long before 20,000 ft. wells will be as common as today's 15,000 ft. holes? Every year brings new depth records.

One thing you can be sure of . . . when the time does come to pierce the earth 4 miles in search of additional oil reserves. . . . Link-Belt Chain will be brawny enough, tough enough, efficient enough to do the job safely and economically.

Since chain was first used in the oil industry, Link-Belt engineers have never ceased matching chain design and construction to the ever changing needs and techniques of drilling. As your new drilling depths and problems arise, you will find that Link-Belt research has anticipated them.

LINK-BELT COMPANY 11,114

Indianapolis 6, Dallas 1, Houston 2, Los Angeles 33, Kansas City 6, Mo., New York 7, Toronto 8. Distributors in all fields.



Silverlink Roller Chain

A.P.I. Chain

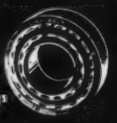
LINK-BELT

Serves the Oil Industry

Enclosed Gear Drives

Shale Shakers

Silverstreak Silent Chain Drives



Roller Bearings

Ball Bearings

LIFT MORE FLUID
with the BEST SWAB MADE

The Guiberson TYPE "K" SWAB with TWO TYPES of CUPS

Field men have never hesitated to acclaim the Guiberson Type "K" Swab the best in the industry—and now it is offered with *two distinct types of cups*, to do more jobs for you and do them *better*.

The STANDARD "K" CUP for the day-in, day-out job—lifts more fluid with every trip . . . for deep or shallow wells —wire basket runs at full speed past tubing gaps without loss of fluid or damage to cup.

TYPE "K" CASING SWAB WITH "K" CUPS →

TYPE "K" CASING SWAB WITH "GW" CUPS →

The NEW "GW" CUP is the perfect answer when you're swabbing in old wells . . . in mixed strings . . . in bad pipe. It's ideal for wells with low fluid level, or for taking water off of gas wells. The "GW" brings up the last cupful!

Both of these fine cups are made of a special oil-resistant compound—resilient, yet strong and long-wearing. Made in all tubing and casing sizes . . . quickly and easily interchangeable.

All Guiberson Swabs utilize the correct swabbing principle!

GUIBERSON

Reg. U. S. Pat. Off.
Established 1919

Guiberson U.S.A.

THE GUIBERSON CORPORATION

Dallas, Texas

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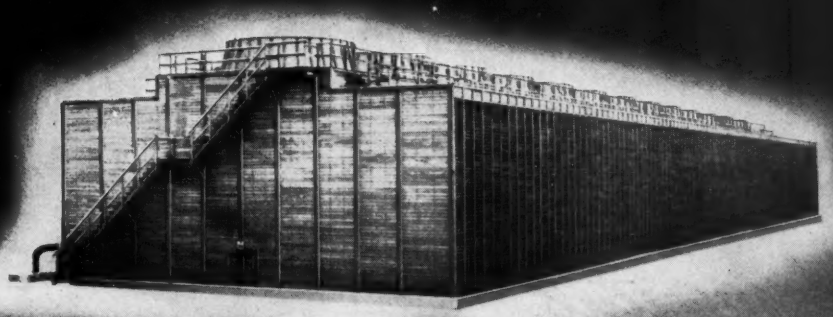
Specify MARLEY Double-Flow



FOR AN ENGINEERED TOWER STRUCTURE

Every Double-Flow Cooling Tower is structurally sound . . . able to give twenty-four hour a day, year around service.

Double-Flow cooling towers have been subjected, during the past decade, to hurricane, earthquake, corrosive atmosphere and other similar tests without suffering a single loss. Here's why:

LUMBER . . . only the finest HEART QUALITY REDWOOD is used. All structural members are properly sized and are free from sapwood that is subject to fungus and insect attack.

HARDWARE . . . heavy bolts are used throughout with ring connectors added at critical joints . . . no nails are used to bear any structural load.

MECHANICAL EQUIPMENT SUPPORT . . . massive, corrosion-free wood crossbeams are used to support the mechanical equipment. Diagonal bracing in this area gives added strength.

COLUMNS . . . vertical columns placed on a maximum of six foot centers. Louver posts are machined to accommodate the continual expanding and contracting slip-fit louvers.

BRACING . . . transverse and longitudinal bracing extending from each six foot height to the bottom of the tower.

Each joint and every detail, as well as the major members of a standard MARLEY DOUBLE-FLOW Cooling Tower are guaranteed against a 30-pound wind. The low, wide design of the Double-Flow gives unusual stability.

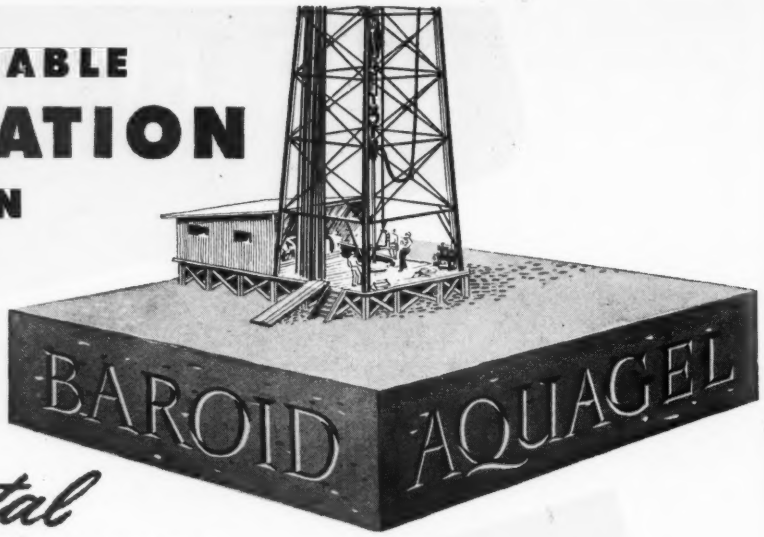
To be sure YOUR new cooling tower is STRUCTURALLY SOUND, Specify MARLEY DOUBLE-FLOW!

Ask for a Marley Factory-Trained APPLICATION ENGINEER to tell you more about the MARLEY-DOUBLE-FLOW and its ENGINEERED STRUCTURE. He'll be glad to help you solve your water cooling problems. No cost or obligation.

MARLEY COOLING TOWERS

THE MARLEY COMPANY, INC. • KANSAS CITY 15, KANSAS

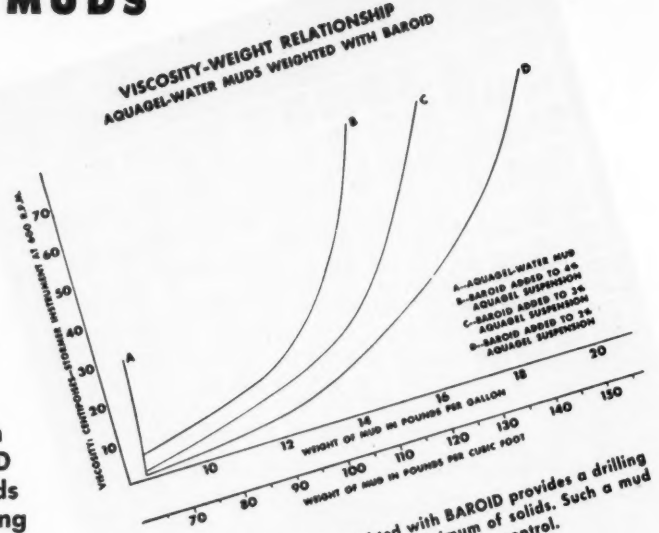
THE DEPENDABLE FOUNDATION FOR MODERN DRILLING



Fundamental TO ALL DRILLING MUDS

Many new and highly effective materials now make drilling muds better than ever before in solving troublesome problems. Baroid takes pride in having substantially contributed to the development of these materials. But, new methods, however spectacular, are nevertheless based upon fundamental concepts and technique.

Modern "know-how" combined with these two pioneer materials—BAROID and AQUAGEL—has resulted in muds capable of permitting straight drilling through most troublesome formations encountered, without highly critical control or maintenance. Such simple muds can readily handle the majority of drilling conditions easily and effectively. If conditions do demand special treatments or extremely low water losses, then Baroid-Aquagel muds provide a perfect base for such control.



An AQUAGEL-water mud weighted with BAROID provides a drilling fluid with maximum weight and a minimum of solids. Such a mud has a basically low water loss and is easy to control.

BAROID SALES DIVISION
NATIONAL LEAD COMPANY
LOS ANGELES 12 • TULSA 3 • HOUSTON 2

The drilling industry has long recognized BAROID as the standard mud weight material. The quantity annually consumed supports this fact conclusively. Similarly, thousands of operators prefer AQUAGEL to all other sources of colloidal material. These facts are a matter of record.

PATENT LICENSES unrestricted as to sources of supply of materials, but on royalty bases, will be granted to responsible oil companies and others desiring to practice the subject matter of any and/or all of United States Patent Numbers 2,041,086; 2,044,758; 2,064,936; 2,094,316; 2,119,829; 2,294,877; 2,387,694; 2,393,165; 2,393,173; 2,417,307 and further improvements thereof. Applications for licenses should be made to Los Angeles office.

COLMONOY Presents
Case of the
CORRODING
PISTON RODS
Featuring
HARD-FACE
NOW I GOT'CHA!
CHIEF REFINERY ENGINEER
SURE IS BALMY. KEEPS MUTTERING SOMETHING ABOUT NaOH AND LIQUID PISTON RODS.
COUNTY SANITARIUM
LOOKS LIKE FOUL PLAY.
RELEASE THAT MAN. HERE COMES COLMONOY NUMBER 6!
CAUSTIC SODA CORROSION IS ENOUGH TO DRIVE ANYONE CRAZY.
WORN PARTS
WE'LL JUST GIVE THIS ROD A SPRAY WELD OVERLAY OF COLMONOY NUMBER 6
I FEEL BETTER ALREADY.
HOW LONG WILL IT LAST?
RECENTLY, A COLMONOY OVER-LAY LASTED 6 TIMES AS LONG AS MONEL METAL ROD.
HARD-FACE
* ACTUAL CASE HISTORY FROM AN EASTERN REFINERY.
1 DEPOSITS ARE ACTUALLY WELDED TO BASE METAL
2 NO POROSITY NOR PINHOLES
3 CLOSE TOLERANCES TO .010
4 QUICK AND EASY APPLICATION
5 LOW COST
WALL COLMONOY
CORPORATION
19345 JOHN R
DETROIT 3, MICHIGAN
Rapid Expansion Program Now On—
Good Territories Open To Jobbers
A PRIZE PACKAGE
WALL COLMONOY CORP.
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FREE
NO OBLIGATION
I am interested in Solving Problems of Wear. Please rush me more information.
NAME
ADDRESS
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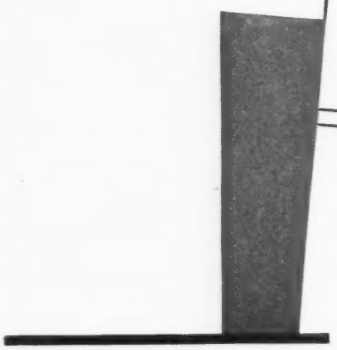
Whether you're drilling, buying, or selling—

a company-owned Bonanza pays!



This versatile 4-place Bonanza is completely at home on the small rough fields of oil rig territory. And because of exceptional speed and comfort, it can "double in brass," too, by taking key men on marketing trips. These reasons (plus low operating costs) explain the popularity of this revolutionary new plane. The Bonanza is just what the petroleum industry ordered! Investigate.

● A note on your company letterhead will bring an informative 60-page brochure on "The Air Fleet of American Business." Write today to Beech Aircraft Corporation, Wichita, Kansas.

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PHONE: CENTRALIA 2575

MAIN OFFICE: 7419 FRANKLIN STREET · FOREST PARK · ILLINOIS · PHONE: FOREST 4300

Mr. Walter H. Beech
Beech Aircraft Corporation
Wichita, Kansas

Dear Mr. Beech:

Our Bonanza is kept at Centralia, Illinois, at our refinery, and is used by both the refinery manager and the sales manager. Among the duties of the former is the procurement of crude oil which means that a great amount of territory must be covered in a short time. We really have to travel.

We have no airline service here, and the only train service runs north and south. With the Bonanza, we make up our own travel schedules to suit our business convenience. The sales manager must make numerous trips around the country, and we have found the Bonanza is the most comfortable and economical mode of transportation.

Very truly yours,

Arrow Petroleum Company

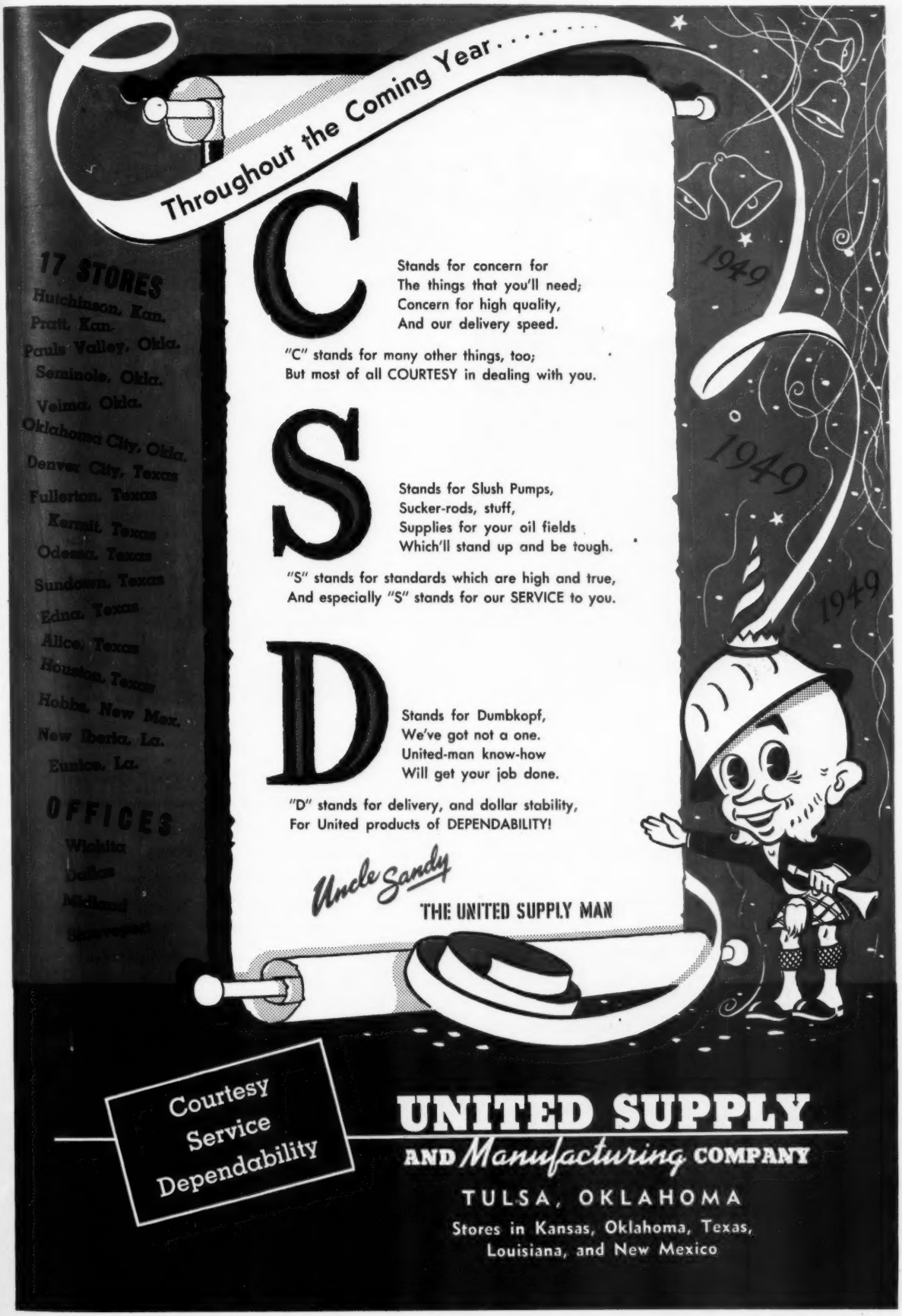
Frank J. Phee

Frank J. Phee
Refinery Manager

Top speed, 184 mph
Cruising speed, 170 mph
Range, 750 miles

BEECHCRAFT
BONANZA
MODEL A35

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS


Throughout the Coming Year . . . . . .
C
Stands for concern for
The things that you'll need;
Concern for high quality,
And our delivery speed.
"C" stands for many other things, too;
But most of all COURTESY in dealing with you.
S
Stands for Slush Pumps,
Sucker-rods, stuff,
Supplies for your oil fields
Which'll stand up and be tough.
"S" stands for standards which are high and true,
And especially "S" stands for our SERVICE to you.
D
Stands for Dumbkopf,
We've got not a one.
United-man know-how
Will get your job done.
"D" stands for delivery, and dollar stability,
For United products of DEPENDABILITY!
Uncle Sandy
THE UNITED SUPPLY MAN
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Hutchinson, Kan.
Pratt, Kan.
Pauls Valley, Okla.
Seminole, Okla.
Velma, Okla.
Oklahoma City, Okla.
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UNITED SUPPLY
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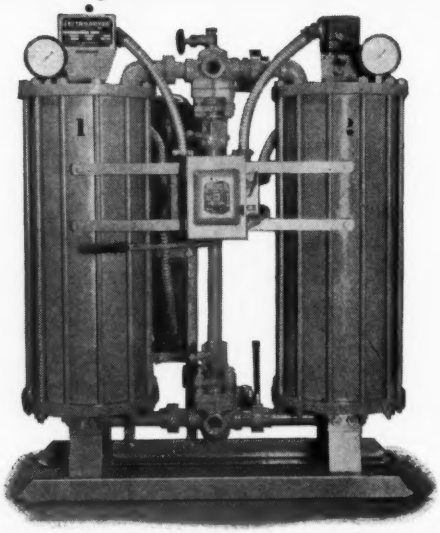
TULSA, OKLAHOMA
Stores in Kansas, Oklahoma, Texas,
Louisiana, and New Mexico

TRADEMARK FOR DEHUMIDIFIERS



You see dehumidifiers bearing this familiar nameplate—Lectrodryer—in hundreds of plants and dozens of industries all over the world. Ever since 1932, they have been helping to speed production and maintain high quality by removing moisture to uniformly low dewpoints.

LECTRODRYER is the name of a large family of DRYing machines. They range in size from the tiny Laboratory model, capable of handling a few cubic feet per hour, to the giant wind tunnel installation handling three tons of air per minute. They DRY air, gases and organic liquids.

You benefit by this sixteen years' experience when you consult Lectrodryer engineers on your DRYing problems. Recommendations on plant layout, controls and other auxiliary equipment are all co-ordinated with the type and size of machine prescribed for the job. You save time and money, and are assured of most efficient operation.

Remember the word LECTRODRYER and, when you need DRYing help, write Pittsburgh Lectrodryer Corporation, 325 32nd Street, Pittsburgh 30, Pennsylvania.

In England: Birlec, Limited, Tyburn Road, Erdington, Birmingham.
In Australia: Birlec, Limited, 51 Parramatta Road, Glebe, Sidney.

LECTRODRYERS DRY
WITH ACTIVATED ALUMINAS

LECTRODRYER
REGISTERED TRADEMARK U.S. PAT. OFF.

Magcobar's My-Lo-Jel keeps water loss mighty low

FIELD REPORTS PROVE IT!

● Magcobar MY-LO-JEL is an improved pregelatinized drilling mud starch in the form of a free flowing powder which can be added directly to the mud through a hopper mixer. It provides positive control of the filtration properties of mud even in the presence of salt, anhydrite and other contaminants. MY-LO-JEL is a blended starch that is especially processed to produce a quick acting, tough and chemically stable plugging agent to inhibit filtration of mud. Thus, it not only lowers the water loss, but keeps it low.

MY-LO-JEL is economical to use. Two to four pounds per barrel of mud is all that is needed to impart the low water loss desired of most muds. It has a stabilizing effect on mud which often greatly reduces the cost of maintenance while drilling. Low water loss muds made with MY-LO-JEL are doing much to hold down the present day cost of drilling by eliminating strings of protection casing, preventing delays due to reaming, hole trouble and fishing jobs.

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DRILLING MUD SERVICE
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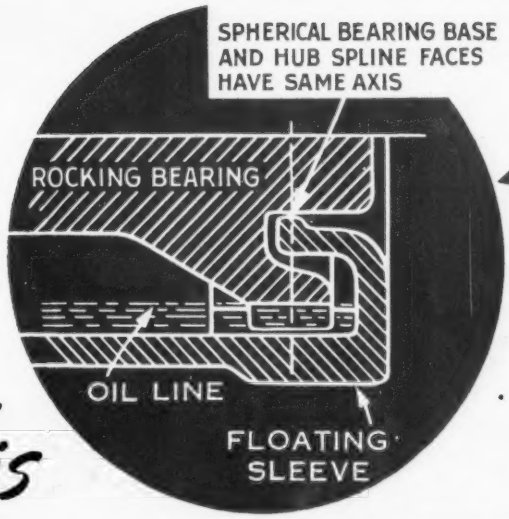


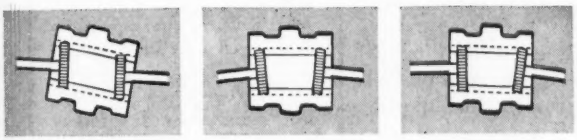
This

Metal-to-Metal Seal says "STOP" to Moisture, Dust and Grit!

That's why FAST'S COUPLINGS Give *Continuous* Service!

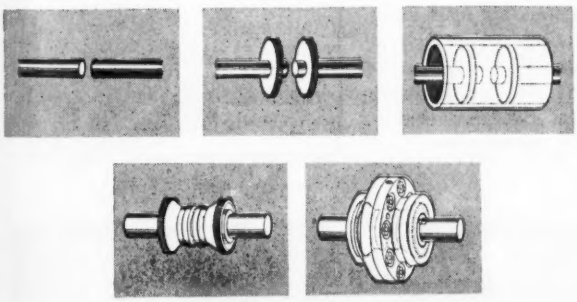
FAST'S self-aligning Couplings are completely free of perishable parts. They're all-steel throughout. At the vital spot shown above, this important feature is achieved through an *exclusive* "rocking bearing." This bearing is exclusive in providing a positive *metal-to-metal* seal that guards the load-carrying oil against troublesome moisture, dust and grit. The bearing is also exclusive in its correctly engineered position which allows *freedom of movement* to compensate for misalignment because its spherical base has the same axis as the hub spline faces. No perishable packing rings are used. There's nothing to wear, nothing to fail. Result: *uninterrupted* power transmission for all your installations!

We have a complete line of couplings for immediate delivery. No matter which type of Fast's Couplings you buy, you get the benefits of years of top engineering experience, Koppers' high standard of workmanship and unexcelled coupling service which assures you of spare parts no matter how old your couplings may be. That means longer machine life, lower upkeep costs, minimum shutdown losses! Koppers Co., Inc., Fast's Coupling Dept., 221 Scott St., Baltimore 3, Md.



Compensate For All Misalignment

The floating sleeve takes a neutral position. All forms of misalignment are compensated for between the lubricated faces of the splines, equally divided between driving and driven members. The entire assembly revolves as one unit.



Simple As A-B-C

Fast's self-aligning Couplings are amazingly simple for the important job they handle. A splined hub on each shaft end. A sleeve with internal splines to mesh. Oil in the sleeve, kept between the splines by centrifugal force, carries the load between the splines.

K KOPPERS

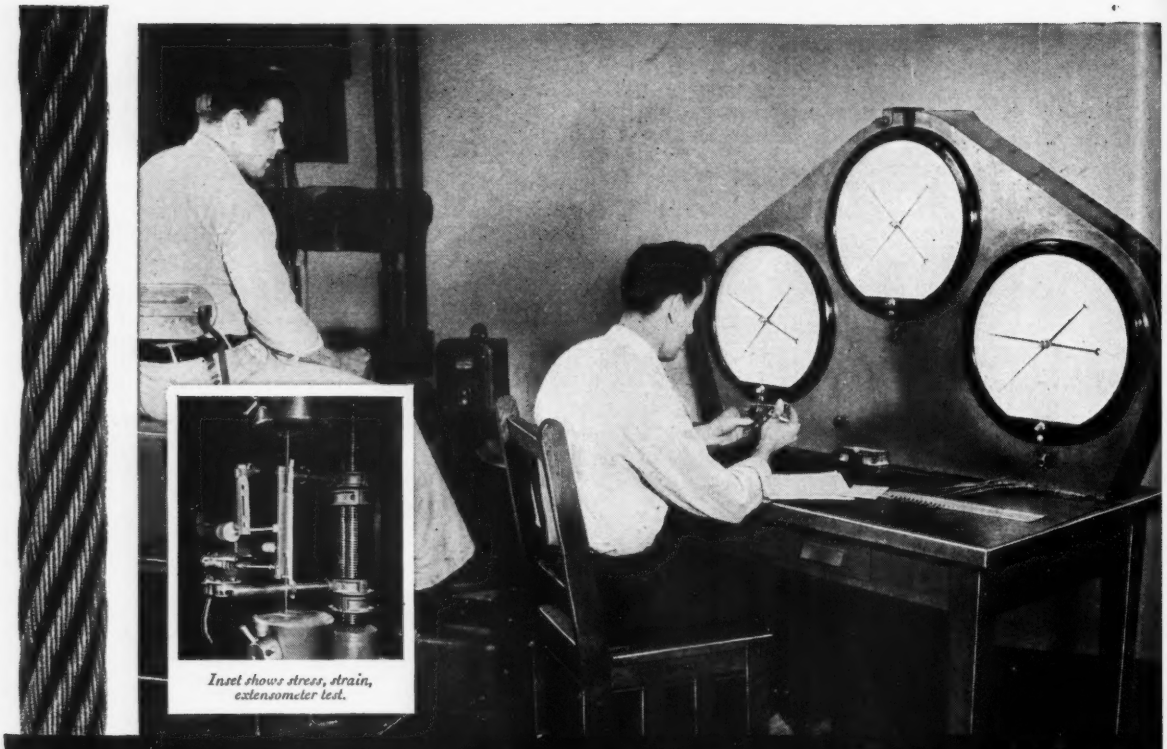
FAST'S *self-aligning* COUPLINGS

SEND FOR FREE CATALOG giving detailed descriptions, engineering drawings, dimension and capacity tables and typical installation photographs for the many types of Fast's Couplings. Fill out this coupon and mail it to: Koppers Co., Inc., Fast's Coupling Dept., 221 Scott St., Baltimore 3, Md.

Name.....Position.....

Company.....

Street.....City.....State.....



Inset shows stress, strain, extensometer test.

How to Measure the Muscle in Rope Wire

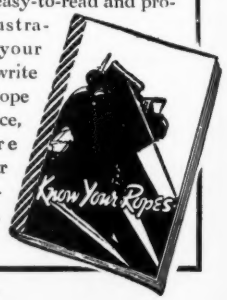
Measuring the muscle—or tensile strength—of rope is one of many important tests used in grading Wickwire Rope. And the engineers who supervise these tests are tough taskmasters.

Before they release a single coil of wire to the Rope Mill, they take two samples from each end of every coil. These samples are gauged for size and roundness. Then the wire is subjected to the extensometer test, the tensile, torsion and elongation tests. Tolerances are even more exacting than those established by the industry; any wire not meeting the standards is rejected. Colored tags listing size, strength and other data are affixed to acceptable coils. These tags stay on the coils until they are made into wire rope—and the data they contain is kept on file for future reference.

This meticulous adherance to standards characterizes every phase of Wickwire Rope fabrication. Coupled with the services of Wickwire Distributors and Rope Engineers in specifying the rope with the right kind of muscle to do your hoisting or hauling job, it is your assurance of the utmost in performance, safety and long rope life. Wickwire Rope is available in all sizes and constructions, both regular lay and WISSCOLAY *Pre*formed. Next time you order wire rope make it Wickwire Rope. After checking its performance we feel certain that you'll keep on ordering it.

THIS 82-PAGE BOOK ON WIRE ROPE IS FREE. WRITE FOR YOUR COPY TODAY!

Thousands of wire rope users have found that the information packed in the pages of "Know Your Ropes" has made their work easier. It's full of suggestions on proper selection, application and usage of wire rope. It's easy-to-read and profusely illustrated. For your free copy, write—Wire Rope Sales Office, Wickwire Spencer Steel, Palmer, Mass.



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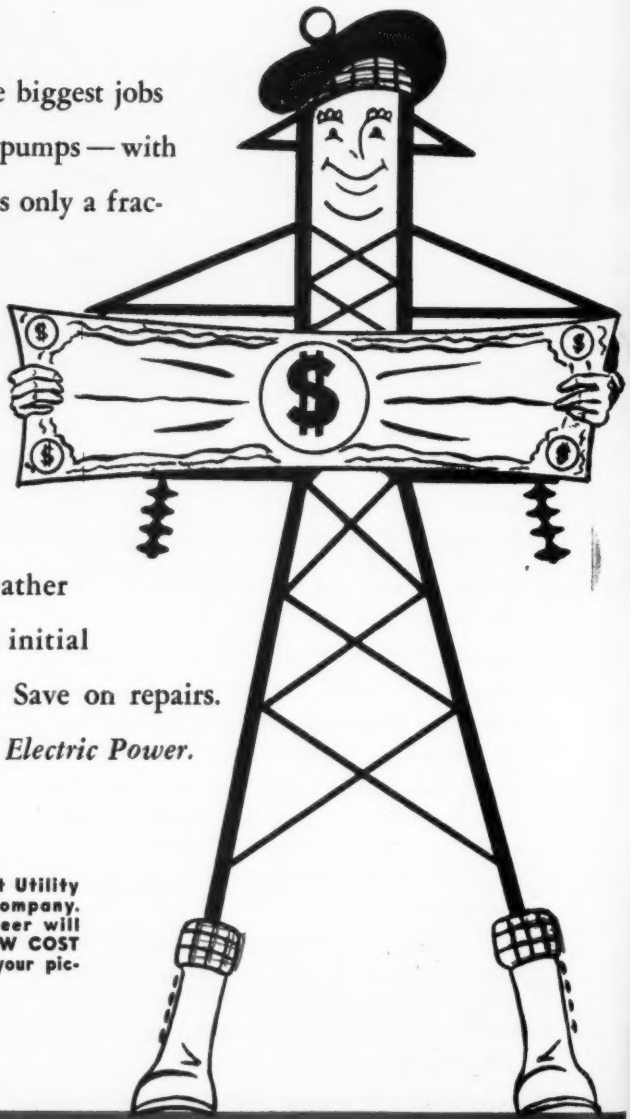
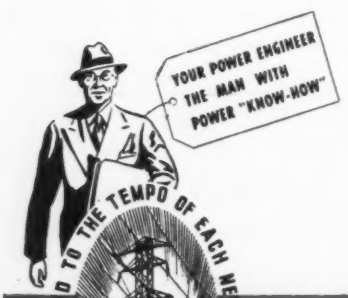


* LOW COST POWER handles the biggest jobs — pipe lines, refineries, multiple pumps — with trouble-free efficiency. If the job is only a fractional horsepower motor, Utility Electric LOW COST POWER is your best bet, too.... You get all the advantages of low operating, maintenance and labor costs . . . easy portability . . . fast starting in all weather . . . s-l-o-w depreciation. Save on initial cost of power-driven equipment. Save on repairs. *Everything's up* EXCEPT *Utility Electric Power.*



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LOW COSTS all along the line

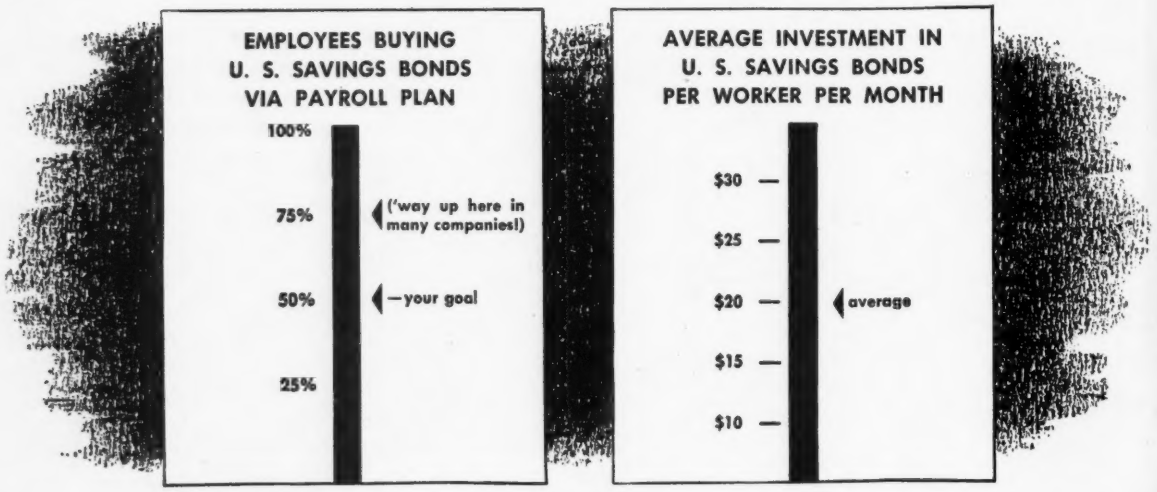
TOP: TRACKSON MD7 PIPELAYER makes overhead river crossing on 20" Colorado Pipe Line.

BOTTOM: ANGLEFILLER on PD4 PIPELAYER grades inside firewall on Illinois tank farm.

Throughout the world, Trackson Tractor Equipment plays a big part in laying cross-country pipe lines. These fast machines, powered by "Caterpillar" track-type tractors, are on the job from start to finish. TRACKSON PIPELAYERS carry, lift, load, lower, bend and cradle pipe — fast, efficiently and at lower cost. They are also used with ANGLEFILLER attachments to backfill, level, grade and do a host of other tasks. TRACKSON TRAXCAVATORS are used to clear rights of way, dig slush pits, level drill sites, build fire walls and dikes, or for any material-handling or dirt-moving job. See your nearest TRACKSON-"Caterpillar" dealer for complete information or write the TRACKSON COMPANY, Dept. OG19, Milwaukee 1, Wisconsin.

TRACKSON
TRACTOR EQUIPMENT

How is YOUR company doing in this "EVERYBODY-BENEFITS" plan?



Compare your employee participation with others who have Payroll Savings

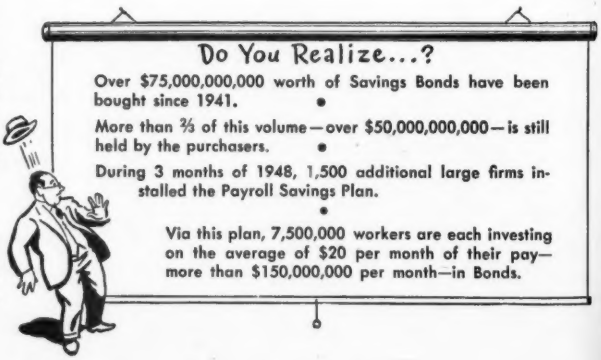
If the figures for your company fall below those shown above, you're missing your share of benefits of the Payroll Savings Plan! These benefits are described below. Nation-wide experience proves that when top management puts the "OK" on the Plan, its benefits rise sharply.

BENEFITS TO *EMPLOYEES:* Every $3 invested in Savings Bonds pay $4 at maturity. Workers gain a 33⅓% return on their money—enabling them in the future to buy more of the things they will want—plus the peace of mind that goes with regular saving.

BENEFITS TO *EMPLOYERS:* The feeling of security that goes with participation in Payroll Savings makes workers more contented. Worrying less, they work better. Among the more than 20,000 large companies with Payroll Savings, records show that—following installation of the Plan—production increased, absenteeism and accidents decreased!

BENEFITS TO THE *NATION:* The Payroll Savings Plan is a powerful deterrent to inflationary forces. Every Savings Bond dollar built up in the Treasury withdraws a dollar from the swollen spending stream. The Plan thus contributes to national security—which affects *your* security!

WHAT CAN YOU DO? If your company has the Payroll Savings Plan, make sure it's being adequately promoted—backed by your top executives—to bring your company its full measure of benefits. If you haven't yet installed the Plan, why pass up its benefits any longer? All the help you need is available from your State Director, Savings Bonds Division, U. S. Treasury Department. He is listed in your telephone book. Call him now!


Do You Realize...?
Over $75,000,000,000 worth of Savings Bonds have been bought since 1941.
More than ⅔ of this volume—over $50,000,000,000—is still held by the purchasers.
During 3 months of 1948, 1,500 additional large firms installed the Payroll Savings Plan.
Via this plan, 7,500,000 workers are each investing on the average of $20 per month of their pay—more than $150,000,000 per month—in Bonds.

The Treasury Department acknowledges with appreciation the publication of this message by

THE OIL AND GAS JOURNAL
Tulsa 1, Oklahoma

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and the Advertising Council.

Heat . . . ***steam heat furnished by a Bettis Steamer*** . . . will solve many problems attendant to operating a power rig in winter-time.

First, there'll be plenty of steam for a derrick floor heater, to keep your crews warm in the coldest weather. You'll also have steam for thawing frozen valves and fittings, warming cold engines, keeping the floor clean and dry, steaming tool joints and steam, even, for a blow-barrel . . . a true morale builder on a power rig.

Because they are fully portable, Bettis Steamers can be removed from the rig during hot weather and used for a variety of other jobs which steam and steam alone can do.

For utmost efficiency, equip your power rigs with Bettis Steamers . . . and be ready for the coldest weather winter can offer.

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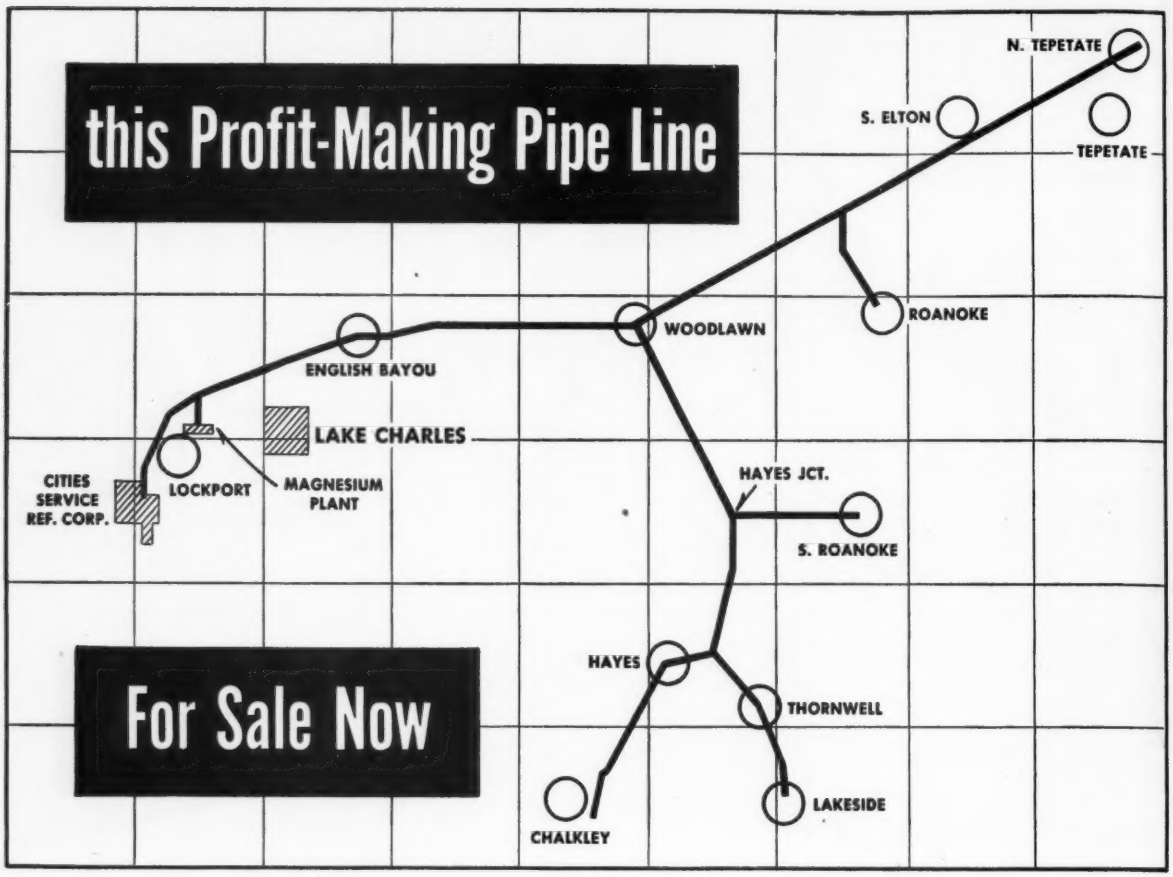

Lake Charles (Louisiana) Gas Line System . . . Plancor 1118

A Sound Business Proposition

This gas line system is a going concern offering a profitable investment opportunity. It is offered for sale on a "where is, as is" basis, for use in place and for continuing operation. Aggressive bidding for this attractive property is anticipated.

★

THE PROPERTY consists of about 100 miles of gas transmission lines of varying diameter, three tracts of land totaling 4.827 acres and right-of-way strip for the entire length of the system. Other improvements include metering stations, dehydration stations, a two-way radio system and miscellaneous buildings. There are no compresser stations, since well pressure is used to propel the gas.

Pipe is high-pressure welded steel, coated and installed through the Louisiana Parishes of Calcasieu and Jefferson Davis and into Cameron and Acadia Parishes. Most of the line is 10, 12, and 16-inch pipe, with some 6, 8, 14 and 20-inch. This well-built line has received first-class maintenance at all times and has been a consistent net income producer.

LOCATION. Starting near the city of Lake Charles, this line extends to Woodlawn, North Tepetate, Lakeside and Chalkley. It serves a group of well-diversified industrial plants and is capable of serving others placed in its distribution scheme.

The line takes gas from six different suppliers and there are additional potential sources. Gas supply contracts range in terms up to 25 years, with renewal options and renegotiation clauses in the contracts.

SEALED BIDS for the purchase of this line will be received at the Washington, D. C. address below until 2:00 P.M., E.S.T., February 10, 1949, at which time all sealed proposals will be publicly opened and read. Interested parties will be given every opportunity to inspect the property and study engineering reports and other pertinent data. For bidding instructions, descriptive information and illustrated brochure, write to the address below or to the Office of Real Property Disposal, War Assets Administration, P. O. Box 6030, Dallas, Texas.

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● Long service life is a primary advantage of Republic ELECTRUNITE Stainless Steel Tubing that pays profitable dividends on your original investment.

Made of long-lasting ENDURO Stainless Steel, this tubing provides the resistance to heat and corrosion, minimum maintenance expense and sanitary advantages of stainless steel. And as made by Republic's improved welding processes, each length is uniformly round and sound, free from rolled-in scale and scale pits. *Full annealing* of all but ornamental grade assures unvarying high ductility throughout every length—throughout every shipment.

For complete information about these and the many other cost-saving advantages of Republic ELECTRUNITE Stainless Steel Tubing—including a list of sizes, gauges and analyses—write *today* to:

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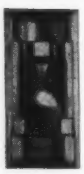
AXELSON STEEL PLUNGERS are designed to give maximum service under all well conditions. "Regular" Plungers, threaded at both ends for conventional A.P.I. valve fittings, are highly polished throughout the entire length and are recommended for ordinary service. Hardened Steel Plungers, designed to A.P.I. specifications, are recommended for more severe pumping conditions. Axelson Stainless Steel Plungers are also manufactured in every A.P.I. size and type. All AXELSON Plungers are available with heavy chrome plating, accurately ground and highly polished, offering superior performance due to the hard, wear-resistant surface.

EXCLUSIVE AXELSON BARNWELL FEATURE incorporates an inwardly-beveled upper lip which produces a wiping action on the upward stroke and deflects sand or other deposits into the fluid column. Double Barnwell plungers are also available, both ends designed with the exclusive Barnwell scraper feature.



THE AXELSON PATENTED PERRY VALVE reduces gas-locking to an absolute minimum. The entire valve is contained within the lower end of the plunger, allowing free upward passage of both fluid and gas. This elimination of gas trap space is particularly effective in deep wells where low compression ratio would cause a large portion of the working stroke to be lost in compressing and expanding the entrapped gas.

AXELSON PIN-END PLUNGERS are designed to give improved service life of the chrome plating. Both ends of the plungers are externally threaded, thus eliminating the hazard of damaging the chrome plating as there are no internal threads to expand when the plunger fittings are tightened.

Pin-end Plungers, as well as all Axelson Plungers, are available with the Axelson grooved feature which produces added efficiency through the sealing effect produced by turbulence in the grooves. This permits the use of a looser-fit plunger and reduces friction without loss of production.

DEEP WELL PUMP

AXELSON *Plungers*

AXELSON FIRST CHOICE *in sucker rods, deep well plunger pumps, pump components, and hydraulic long stroke pumping units.*

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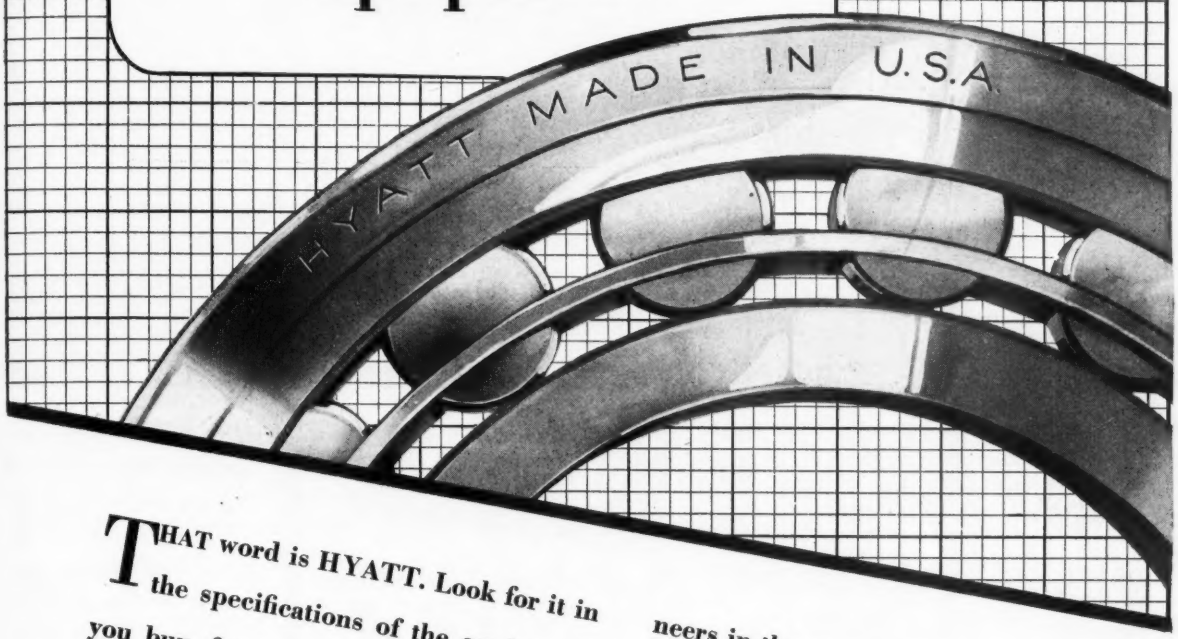
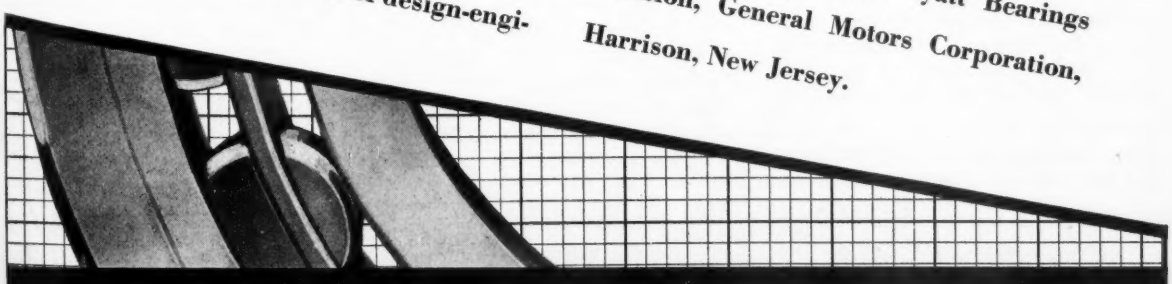
A word for the buyer of pumping equipment

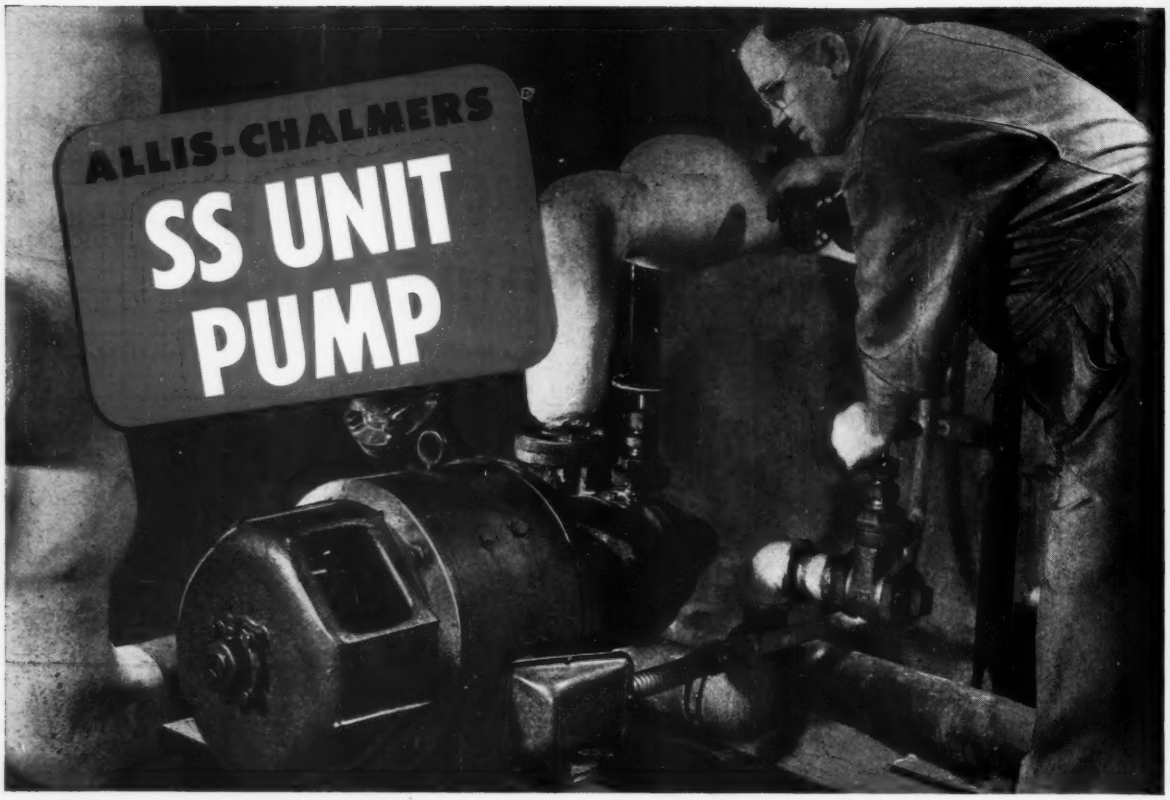


THAT word is HYATT. Look for it in the specifications of the equipment you buy, for it's your guide to a better grade of roller bearings—bearings which in most cases will outlive the equipment to which they are applied.

Hyatt Roller Bearings, for many years, have been the first choice of design-engineers in the petroleum field. Hyatts prolong the life of the equipment—reduce maintenance cost—and stand up under the most rugged service. Manufacturer and operator alike know the true value of the word HYATT. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.



HYATT ROLLER BEARINGS



50% MORE WATER
33% LESS POWER

"Our *old* displacement pump required 15 hp motor to raise 100 gpm 110 ft to roof tanks. *Now* this A-C SS Unit Pump Lifts 150 gpm to same tanks with only a 10 hp motor!"

THAT'S THE EXPERIENCE, along with worthwhile savings in space and maintenance, reported by the chief engineer of a large commercial building.

It is the kind of saving that you, too, may be able to make with Allis-Chalmers SS Unit Pumps. Here are 4 reasons why:—

Deliver Rated Efficiencies — Every unit tested at the factory and the performance curve plotted. Efficiency is proved.

Heavy Construction — Compare section thicknesses, shaft diameters and other features. See why SS Unit Pumps run years without repairs.

Easy Maintenance — Compact design and few parts reduce maintenance. Bronze ring protects casing from wear. Is easily replaced when required.

Application Engineering — When a pump is recommended by an A-C Pump Application Engineer, you know that you are getting the pump that fits your needs exactly and that will give you dependable service at low cost per gallon.

SS Unit is one of many Allis-Chalmers models for most industrial pumping services. For information, see your Allis-Chalmers Authorized Dealer or District Office. Or write for Bulletin 52B6059E. Also listed in Sweet's. A 2595

SS Unit, Texrope and *Vari-Pitch* are Allis-Chalmers trademarks.

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Applied . . .
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MOTORS — ½ to 25,000 HP and up. Matching Allis-Chalmers Control.

TEXROPE — Belts in all sizes and sections, standard and Vari-Pitch sheaves, speed changers.

PUMPS — Integral motor and coupled types. Sizes and ratings to 2500 GPM.

ALLIS-CHALMERS

Snap-on Bench Grinders

with the famous Blue-Point Trade Mark

. . . have the construction features for smooth, powerful operation . . .

COMPLETELY ENCLOSED MOTOR: Super-powered, precision-balanced motors enclosed to prevent dirt, grit, etc. from entering.

BALL BEARING CONSTRUCTION: Oversize, grease sealed ball bearings used throughout, assure smooth motor operation.

LARGE RUGGED BASE: Rubber feet provide solid mounting free from vibration. Recessed bolt openings for permanent mounting.

INDUCTION RUN MOTOR: Develops less heat in the windings — more desirable for continuous operation.

STURDY TOOL RESTS: Adjustable for any type of work with ample take-up for wheel wear.

LARGE WHEEL GUARDS: Allow use of special shape grinding wheels or wire brushes. Guards fitted with chip breakers.

BELL TYPE CONSTRUCTION: Provides full clearance so that long straight pieces may be ground across the face of the machine.

CAPACITOR START MOTOR: Uses low starting current . . . actually less than 15 amps. are consumed.

VOLTAGE: Standard models of the ⅓ H.P. and ½ H.P. grinder require 110 Volts, 50/60 cycle AC current. Standard 1 H.P. grinder takes 220 Volts, 50/60 cycle AC current. Special voltage models available.

GRINDING WHEELS

of natural aluminous oxide abrasive . . . fully vitrified. From 60 grit for fine grinding to 24 grit for heavy work.

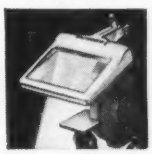
WIRE WHEEL BRUSHES

High quality wire and metal, bound to prevent chips flying loose. Crimped bristles cannot bend or break.

WHEEL DRESSER

Quickly trues, cleans grinding wheels. Protective hood over cutters. Includes extra set of easily inserted cutter wheels.

STURDY EYE SHIELDS



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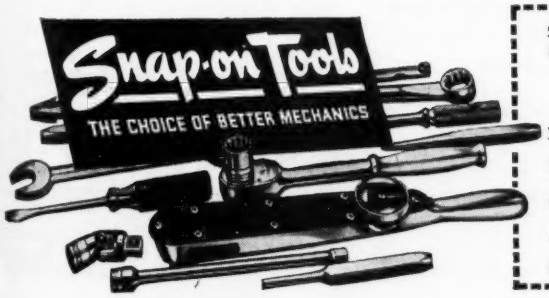

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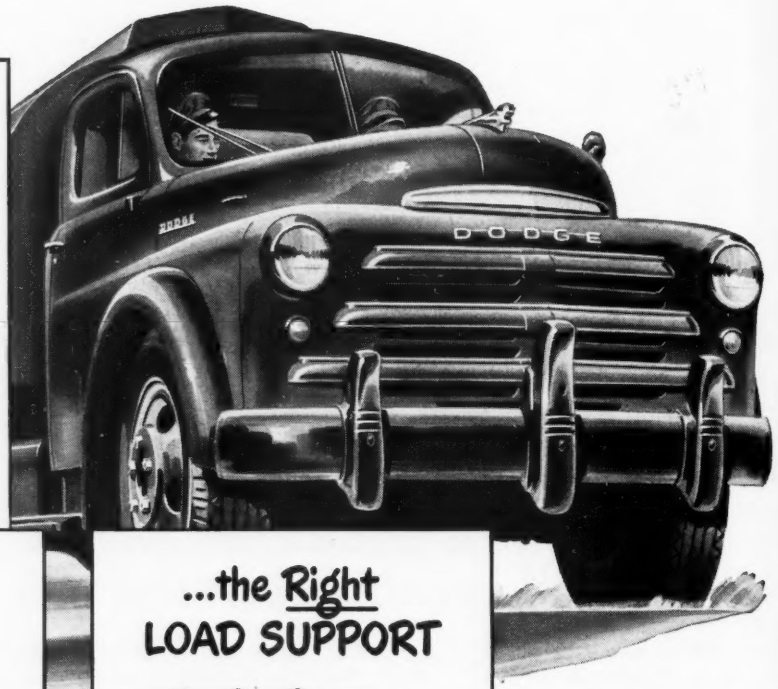

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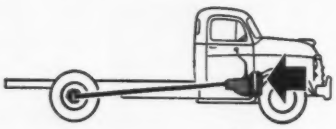

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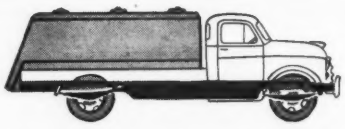

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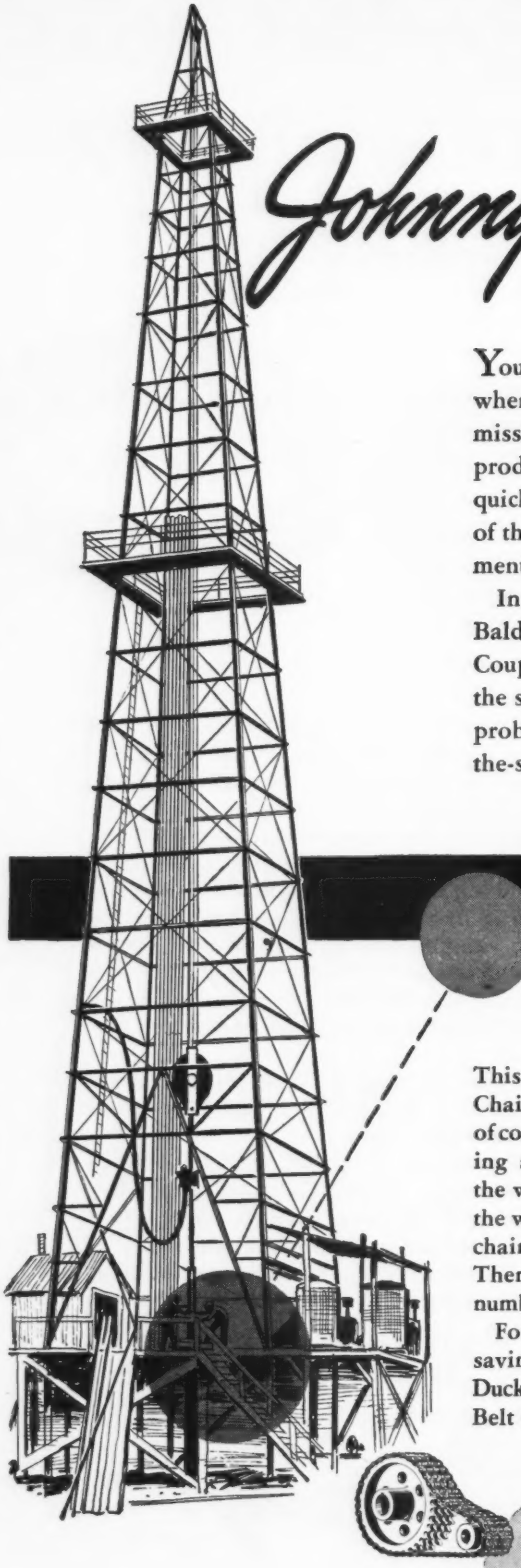

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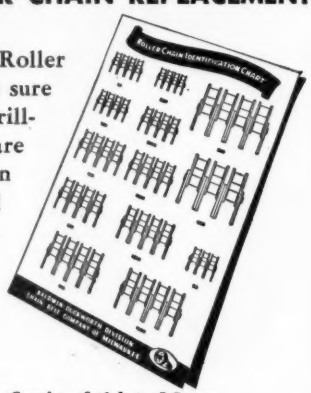

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JOURNALLY Speaking

How Thick Is a Pipe?

A LETTER from Benjamin Miller, well-known consultant and contributor of many high-powered technical articles on pipe-line flow and such to our favorite oil paper, points out that our pages report the fact that some new pipe-line projects specify pipe with walls much thicker than others of the same capacity. Ben thinks that most all of them are thicker than necessary, and wants something done about it. He writes:

"Steel is now as desperately needed as it was during the war, yet much of it is being wasted by using too much of it in pipe too thick for the job. Couldn't you do something to stop this waste and get more transportation of oil and gas from the available tonnage of steel?

"The Oil and Gas Journal has a lot of influence within the industry and outside. If you started a campaign for more intelligent use of steel it would get lots of support and action.

"The younger engineers in the operating companies appreciate the possible savings from correct application of modern technology, but the men in charge make decisions on the basis of their own personal experience, which does not include familiarity with recent ideas about pipe-line design.

"Is there any reason why the pipe-line branch of the industry must be last to get up to date? If steel goes under complete allocation there may be howls from those who didn't get it when others get more than they really need."

That the writer has good judgment is evident from his estimate of our influence, but we aren't much given to campaigning for or against anything. Far be it from us to mix into a fight among experts as to how thick a pipe ought to be. Nor can we be induced to comment on Ben's assertion that pipe liners are "the last to get up to date."

But maybe he has something there. With steel so scarce, and line pipe the scarcest item of all, any suggestion for extending the supply would seem to be worth serious consideration. Our job is to report the doings and views of the industry. If any of the "younger engineers" care to support Crusader Miller by means of the printed word we will try to find space for same. Ditto for the thick-walled school of thought.

That Good Gulf Hall

PROMOTIONS lead oil companies into some odd bypaths. For example, there is the Gulf Marine Hall of Fame, which has got the venerable Gulf Oil Corp. into the business of holding power-boat regattas and awarding gold cups to the winners.

Incidentally, this promotion promoted the promoter right out of its promotion. At first the prizes were given only to racers who used the products of you know what oil company, but the thing got so big that the racing fraternity sort of moved in and took over, so now a man can hope for a prize when using any old brand of gasoline and lube oil. All Gulf gets out of it now is some good will and the use of its name, but those are rather desirable commodities these days.

Moving Tribute

A TRIBUTE to the up-to-dateness of our personals pages was picked up recently by one of our staff men who was dickering with some movers to haul his household goods. When our man mentioned The Oil and Gas Journal to one of them his face brightened up. His firm always checks our personals, he said, to find out what oil men are moving and where. He got the job.

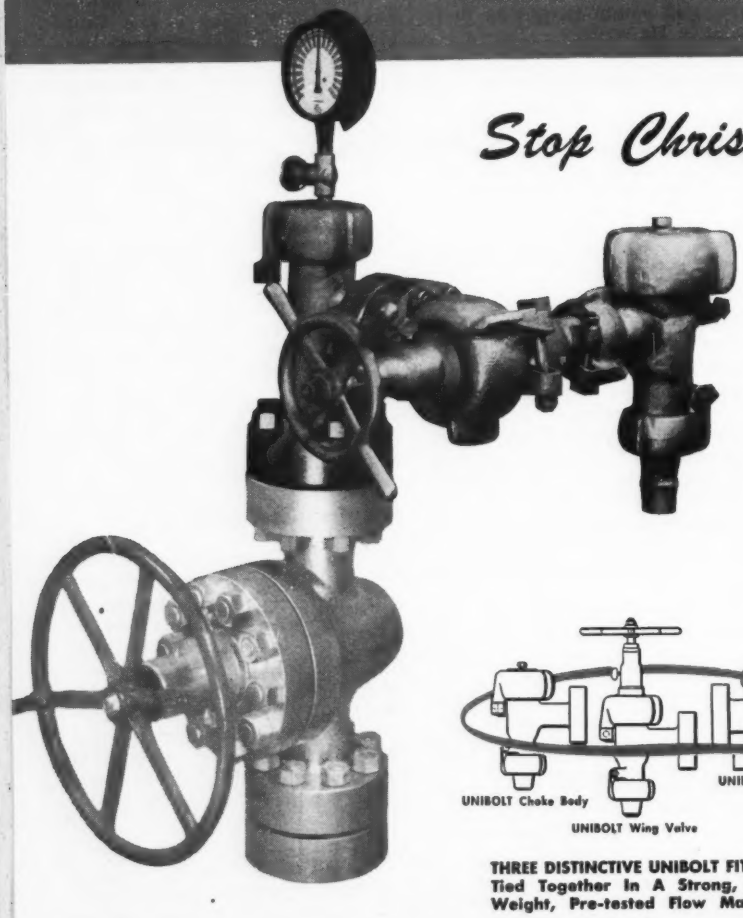
Foot Easer

A RESEARCHER into petroleum's early history reports that Indians taught colonial soldiers to ease aching feet with oil from seepage pools. This military use of oil has advanced so that not only was the last war won with it but some officers we know regularly avoided aching feet by using oil-powered jeeps just to cross a company street.

UNIBOLT FLOW MANIFOLDS

in CORROSION-RESISTANT

HIGH-CHROME ALLOYS

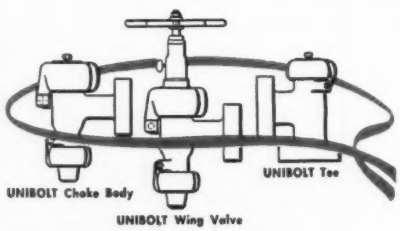


Stop Christmas Tree Corrosion!

Several years ago when the industry developed a market for gas-distillate production, UNIBOLT engineers initiated a research program to develop a corrosion-resistant alloy for Christmas tree flow wings. A number of stainless steels with varying heat treatments were investigated, but laboratory tests on one particular high-chrome alloy demonstrated unusually good corrosion-resistant qualities.

Test installations of UNIBOLT fittings from this alloy were begun nearly three years ago on wells where ordinary steel fittings had become extremely corroded in as little as 40 days. Recent inspections reveal that the corrosive gas-distillate flow from these wells has had absolutely no effect on the UNIBOLT high-chrome fittings.

Complete UNIBOLT Flow Wings (see illustration) are now offered in this same corrosion-resistant alloy in 5000 and 10,000 lbs. working pressure and in carbon steel in 3000 and 5000 lbs. working pressure. Because UNIBOLT Flow Wings are stronger, yet eliminate much of the bulk and weight of conventional Christmas tree wings, they are both safer and more economical.



THREE DISTINCTIVE UNIBOLT FITTINGS Tied Together In A Strong, Light-Weight, Pre-tested Flow Manifold.

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FOUNDED IN 1910 BY PATRICK C. BOYLE

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Subscription rate to the petroleum industry, United States and foreign, 1 year, $3.00. Single copies, 50 cents. Back copies when over a year old, one dollar. Note: Payments from outside the U.S.A. may be in the form of an international money order or check on a U.S.A. bank. Entered as second-class mail matter at Tulsa, Okla., under Act of March 3, 1879. Copyright 1949 by The Petroleum Publishing Co.

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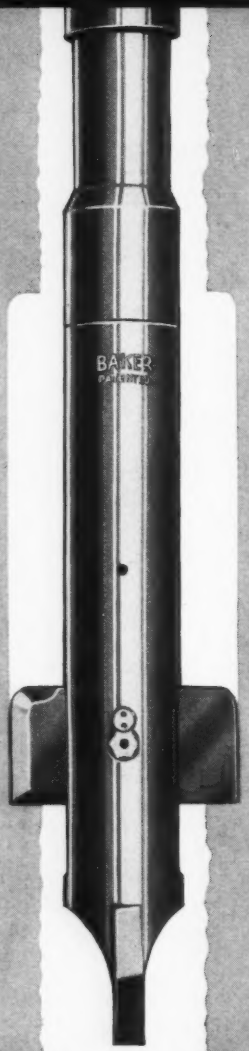

FOR SAFE, LOW-COST HOLE ENLARGEMENT

. . . no other tool is equal to the BAKER ROTARY WALL SCRAPER.– When it is desirable to enlarge the diameter of an open hole to an extent considerably greater than the diameter of the casing, you can depend upon this strong, safe Wall Scraper with blades which open positively when pump pressure is applied. The uncased hole *can be enlarged at any point,* and by changing to progressively larger sizes of blades, an amazingly increased diameter can be secured. Example: No. 6 size Scraper can be run safely through 9⅝" API casing, then will ream from a minimum of 9¼ inches to maximum of 19 inches by changing to increasingly larger sizes of blades.

RUGGED BLADES CLOSE SAFELY

Baker Wall Scraper blades have extra-long vertical cutting edges which prevent any tendency to "corkscrew" and insure scraping the maximum footage of full-gauge hole. And, when the Scraper is to be removed from the hole, pumps are shut down and a strong spring aids in closing blades into body. These blades are made from alloy steel forgings, and their cutting surfaces are hardfaced and set with tungsten carbide inserts to insure long cutting life.

MANY IMPORTANT USES

THE BAKER ROTARY WALL SCRAPER is extremely versatile and is successfully and economically used for many worthwhile applications, a few of which are shown below. It will pay you to learn all about the Baker Rotary Wall Scraper (Product No. 500-D) from your BAKER (or Composite) CATALOG, or better yet, ask the Baker representative in your area for helpful suggestions as to how this efficient tool will fit right into your drilling program.

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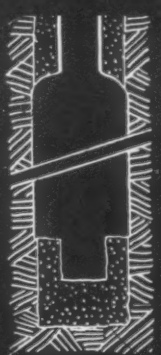
ROTARY HYDRAULIC EXPANSION

WALL SCRAPER

PRODUCT NO. 500-D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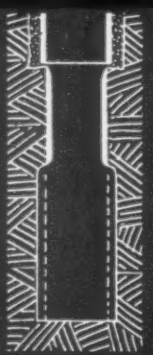
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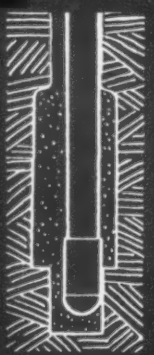
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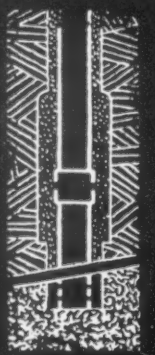
Fig. 5

Fig. 6

These typical uses illustrate a few of the many worthwhile applications of the Baker Rotary Wall Scraper.

Figure 1—WATER SHUT-OFF TESTS are made after rat-holing below the shoe, "wall scraping" for a vertical distance of 5 feet or more to the gauge of the original hole (or slightly beyond). Figure 2—ENLARGING HOLE TO SET CASING OR LINER with maximum ease and safety. Figure 3—REMOVING MUD SHEATH from the face of the formation to permit cement to bond with original formation. This same procedure is used to scrape the face of the oil sand to increase production. Figure 4—BOTTLENECKING to insure complete encasement of the shoe joint with cement; also to minimize hazard of channeling at this vital point. Figure 5—ENLARGING HOLE FOR C.P. JOB—showing "bottlenecked" section with casing or liner serving as water string above, and oil string below, the cementing point. Figure 6—GRAVEL PACKING is easily and effectively performed when the hole has been enlarged with a Baker Rotary Wall Scraper.

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OIL TOOLS, INC.

HOUSTON • LOS ANGELES • NEW YORK

THE OIL AND GAS JOURNAL

Government Pattern

THE pattern for the federal administration which is now getting settled in Washington has been set by the three messages President Truman sent to Congress. The principal features which affect the petroleum industry are well outlined in this issue of the Journal. They deserve study by all oil men concerned with the future of their operations.

The pattern is not radical, as we have come to view that term these days, but it is well to the left of center. It purports to retain the competitive, free-enterprise system, and this intention should be considered as sincere. But the field within which business may have a free play is to be further circumscribed by an ever-encroaching government paternalism.

The specific measures asked of Congress by the President are not too alarming in themselves, and they had been anticipated. Business can live under them, though the going may be a bit tougher. What is disturbing is that the proposals appear to be only a part of a trend. They are offered not as a finality but as current steps in a long-range program. Behind them seems to be the attitude that this is about all that can be asked at one time without causing too anguished an outcry.

The recommendation for "planned use" of tidelands oil, the request for a government-operated synthetic-fuels program, the concern of the Council of Economic Advisers over the long-range energy outlook—these are symptoms of the type of thinking of the policy makers in Washington. They are evidence that the administration has a fundamental distrust of the ability of a free-enterprise system to meet the needs of the public for oil, steel, and other commodities in general demand.

Not only in fuels but in other matters the Government thinks it can do better than industry could do alone. Typical is the President's assumption that Government working with business can assure higher production, more employment, and lower prices; and that the Government must always be in a position to take definite action whenever something develops in the national economy which the Washington planners view with alarm.

At the moment the alarm is centered on the shortage of steel. And the remedy, quite naturally, is for the Government to construct more plants and in the meantime to control prices and allocate distribution.

By the skin of its teeth the oil industry escaped being singled out for specific control recommendations. Had it not, during the past year, pulled itself up by its own bootstraps to a position of adequate supply there is no doubt that the administration would now be sponsoring a federal oil-control bill. How long it can continue to keep one jump ahead of the government planners would seem to be a matter of time and luck in view of the pattern the Truman administration has set for itself.

Truman Asks Tidelands Rule, Expanded Steel Facilities, Continued Controls

by Bertram F. Linz

WASHINGTON. — Declaring that "some of our natural resources are still being wasted," President Truman told Congress last week that "in our present dynamic economy, the task of conservation is not to lock up our resources but to develop and improve them," and called for adoption of a program for the planned use of the petroleum reserves under the sea, "which are—and must remain—vested in the federal Government."

Observers saw in the President's statement—the only direct reference to oil in his annual message on the State of the Union—a determination to veto any measure Congress might pass to return the tidelands to the states and to call upon the Democratic leaders at the Capitol to see that his veto stuck.

While the President made all the recommendations for legislation expected of him, including the inflation controls he had vainly urged upon the Eightieth Congress, the tone of his message was far less hostile to business than had been anticipated in many quarters.

In only three respects did his recommendations vary from those he has offered, directly or indirectly, in the past.

Profits Tax Not Asked

While the President called for tax legislation to bring in an additional $4,000,000,000 a year, he did not ask for the expected excess-profits tax although he said the new revenue should come principally from additional corporate taxes. A portion should come from revised estate and gift taxes, he said, and consideration also should be given to raising personal income-tax rates in the middle and upper brackets.

A modified form of wage control was suggested along with the authority to impose price ceilings.

The other deviation from his known program was a request for an immediate study of the adequacy of production facilities for materials in critically short supply, such as steel, and, if necessary, authorization of government loans for the expansion of facilities to relieve such shortages, and government construction of plants if action by private industry fails to meet the country's needs.

By inference, the President accepted the view taken in some quarters of the administration that his return to the White House was a "mandate from the people."

"We believe that our economic system should rest on a democratic foundation and that wealth should be created for the benefit of all," he said. "The recent election shows that the American people are in favor of this kind of society and want to go on improving it."

The President began his message by reporting to Congress that "the State of the Union is good" and, he said further on, "our private enterprise system has reached new heights of production."

Business Expansion Sought

But, he added, "we cannot afford to float along carelessly on a postwar boom until it collapses. And it is not enough merely to prepare to weather a recession if it comes. Instead, Government and business must work together constantly to achieve more and more jobs and more and more production — which mean more and more prosperity for all the people.

"So far as business is concerned," the President declared, "it should plan for steady, vigorous expansion —seeking always to increase its output, lower its prices, and avoid the vices of monopoly and restriction. So long as business does this, it will be contributing to continued prosperity, and it will have the help and encouragement of the Government."

However, Truman emphasized, despite our favorable present situation, our prosperity is threatened by inflationary pressures at a number of critical points in the economy, and the Government must be in a position to take effective action at these danger spots.

A number of the President's recommendations on this and other points, enacted into law, would affect the oil industry. These included:

Enlargement of the power to control bank credit.

Continuation of export control authority and provision of adequate machinery for its enforcement.

Continuation of priority and allocation authority in the field of transportation.

Authorization of priorities and allocations for key materials in short supply.

Provision of standby authority to impose price ceilings for scarce commodities which basically affect essential industrial production or the cost of living, and to limit unjustified wage adjustments which would force a break in an established price ceiling.

Repeal of the Taft-Hartley Act and reenactment of the Wagner Labor Relations Act with amendments outlawing jurisdictional strikes and unjustifiable secondary boycotts, prohibiting the use of economic force to decide issues arising out of the interpretation of existing contracts, and providing means for settling or preventing strikes in vital industries which affect the public interest.

Strengthening of the antitrust laws by closing loopholes that permit monopolistic mergers and consolidations, to assure small business the freedom and opportunity to grow and prosper.

Increasing the minimum wage to at least 75 cents an hour.

Expansion of social security, both coverage and benefits.

Extension of the Reciprocal Trade Agreements Act for 3 years.

OIT Revises Commodity List for Export Licenses

WASHINGTON.—A revised list of commodities requiring specific licenses for export, many of them with new Schedule B numbers which must be shown on all export declarations filed on or after February 1, was put into effect January 3 by the Office of International Trade.

The new list sets up two classifications for aviation motor fuel, which formerly had the Schedule B number 501600, calling for motor fuel of 100 octane or over (Schedule B 501610) and fuel under 100 octane (501650). The only other change in the petroleum classification was the redesignation of blending agents as Schedule B No. 501400 (formerly 501325).

The classifications for casing and line pipe also have been expanded. Formerly, there were but two classifications, seamless (606200) and welded (606300). The new order sets up seamless casing (606250) and seamless line pipe (606290); and welded casing (606350) and welded line pipe (606390).

Baker Says Industry Making Huge Expenditures to Save Texas Gas

THE postwar gas conservation program in Texas involves the investment of more than a quarter of a billion dollars in 138 plants to conserve nearly 2¼ billion cubic feet daily of casing-head gas which otherwise would not be fully utilized, Hines H. Baker, president of Humble Oil & Refining Co., told the Rotary Club of Beaumont last week during a celebration of the forty-eighth anniversary of the discovery of Spindletop field.

This record of accomplishment is the best evidence of the industry's real interest in conservation and utilization, he said.

"Nearly 40 per cent of this postwar program has already been completed and another 36 per cent will be completed in 1949," Baker explained. "This program is being carried out despite the fact that many of the projects show a small return on the investment at present gas prices and some of them even involves an operating loss over a period of years.

Saving 70 Per Cent Now

"It is estimated that in 1948 the petroleum industry conserved nearly 70 per cent of all the casing-head gas which could be economically utilized, and that by 1950, when the postwar gas conservation program is completed, the amount of casing-head gas conserved will be 90 per cent or more of the maximum that can be economically utilized.

"Unquestionably this is one of the most significant advances in the history of the conservation of a natural resource."

Gas reserves in the United States are equivalent in weight and heating value to the oil reserves and they could be almost equal in economic importance and value, so their conservation is equally important, Baker stated.

"Each 6,000,000 cu. ft. of gas contains fuel value equal to a barrel of crude oil. Today this gas sells at the well head for around 5 cents a thousand cubic feet, or the equivalent of about 30 cents a barrel of oil. New contracts often provide for a current price as high as 10 cents.

"These low prices constitute a major obstacle in the way of greater conservation because most gas conservation projects require large initial investments that cannot be justified unless field prices are higher than they have been in the past."

Declaring that gas-well gas is now fully conserved, Baker said the problems of gas conservation now relate chiefly to casing-head gas produced with crude oil, and this can be utilized in only two ways, either by marketing it or returning it to the formation for storage and to assist in oil recovery. In some types of reservoirs the gas cannot be returned to the ground, and to warrant marketing the price must be sufficient to justify the large expense of gathering and treating.

"These circumstances," he said, "make it impossible to utilize all of the casing-head gas produced with oil. Engineers estimate that under the present conditions in Texas it may be possible to conserve fully only about 80 per cent of the casing-head gas produced and that it would be economically wasteful to attempt to conserve the remaining 20 per cent.

"Perhaps an illustration of what a single company, the Humble company, is doing in this respect may illustrate the scope of this program. By the end of 1950 Humble will have spent approximately $30,000,000 since the war in new casing-head gas conservation facilities, which will conserve approximately 292,000,000 cu. ft. daily of casing-head gas which otherwise would not be fully utilized. I might also mention that Humble's contribution to the conservation of casing-head gas was significant even before the inauguration of the present program. Thus, prior to 1945, Humble had already spent approximately $12,000,000 in casing-head gas conservation facilities, so that when the present program is completed, Humble will have a total investment of about $40,000,000 in such facilities, which will conserve 440,000,000 cu. ft. daily of casing-head gas.

"The immediate problem of casing-head gas conservation arises out of the increase in the volumes of casing-head gas produced along with increased oil production and the lack of satisfactory markets for such gas. Because of war and postwar demands, oil production in Texas has practically doubled and with it has come an abnormal increase in casing-head gas production. Thus, the gas conservation facilities which were in existence prior to the war were not adequate to take care of the additional quantities of casing-head gas produced. Moreover, the postwar shortage in steel has delayed the completion of additional casing-head gas conservation projects.

"One deterrent to the greater conservation of casing-head gas is the interpretation given the Natural Gas Act allowing the Federal Power Commission to fix the price at which gas at the well is sold to a purchaser who delivers it to an interstate line.

"Another deterrent in Texas to casing-head gas conservation is the lack of a law permitting the cooperative development and operation of oil reservoirs—similar to the existing law permitting pooling of gas reservoir—so that the casing-head gas produced by a number of operators may, in a joint undertaking, be processed for natural gasoline recovery."

The Tom O'Connor gasoline plant located 15 miles from the town of Refugio, Refugio County, Texas, is one of 138 plants in the postwar gas conservation program in Texas. Humble Oil & Refining Co. and Quintana Gas Co. are joint owners of the plant. It has a design capacity of 35,000 M.c.f. of gas daily and was completed during 1948. Production is approximately 385 bbl. daily of propane, 350 bbl. daily of butane, and 350 bbl. daily of natural gasoline

Truman Advisers Say Expansion Of Oil Industry Must Continue

by Bertram F. Linz

WASHINGTON.—President Truman's Council of Economic Advisers predicted last week that the oil industry will have to continue its expansion expenditures at the 1948 rate or better over a period of years.

In an exhaustive study of the whole economic situation, on which the President based his recommendations to Congress for legislation on the tidelands, inflation control, etc., and which will be the framework for further recommendations on synthetic-fuels development, research, and other subjects, the council pointed out that not only will heavy expenditures be required if the industry is to maintain its additions to visible reserves at present rates, but the sharp competition which is in prospect among coal, oil, gas, and electricity will speed technical developments which require relatively large amounts of capital.

Outstanding among these developments, it listed further mechanization of coal mining, gasification of coal, synthetic oil, and further substitution of electricity for direct use of fuels.

The council estimated that the oil industry spent about $1,500,000,000 last year for wells and other facilities for domestic crude production, and probably almost as much for domestic facilities for transportation, refining, and marketing.

"The need for continued expansion is clear," it said, "but all estimates of future investment must be conditioned upon the rate of development of new oil reserves.

Reserves Keeping Pace

"In 1947, 2,700,000,000 bbl. were added to visible reserves of petroleum, and in 1948 about 3,000,000,000 bbl. Since only 2,000,000,000 bbl. were withdrawn in 1948, our known reserves have expanded roughly in line with the trend of increase in production.

"In the interests of national security, we should attempt to maintain or improve the relationship between reserves and production. If new reserves could hereafter be added at the 1948 rate, capital outlays at about the 1948 scale would have to be maintained. Any increase in the difficulty of development of new reserves would be reflected in larger outlays in relation to accomplishment. At the same time, higher prices resulting from such higher costs would have the offsetting effect of encouraging substitution of imports, synthetics, or other fuel sources."

So far as natural gas is concerned, the report stated, industry estimates that $2,650,000,000 will be spent on expansion during the 5-year period 1948-52 imply a large decline from present rates of expenditure, and the figures for the later years "are almost certainly too low, if only because plans are not fully made so far in advance."

On the other hand, the council said, the expansion of long-distance pipe lines is unlikely to continue at present rates for as long as a decade. This belief, it was explained, is based on the expectation that the present market advantage of gas over other fuels in some industrial regions will be reduced somewhat as higher field prices and pipe-line-construction costs are reflected in delivered-gas prices, and the probability that more rigorous application of public policies which encourage the use of natural gas in the areas of production rather than transmission to other areas may limit the investment requirements of the gas industry.

No New Energy Foreseen

The council saw little likelihood that such potential sources as atomic energy, sunlight, wind, and tides will play a significant role in energy production within the next few years "although they deserve continuing exploration and development in view of the exhaustible character of mineral fuels."

At the same time, it said, it is impossible to predict what expansion will take place in the development of power through the use of coal, oil, natural gas, and water power, among which competition is sharp, and technical developments still in the making will play a large part in shaping relative growth trends.

However, the council emphasized, a sound conservation policy should encourage the use of water power and coal as against the more quickly exhaustible oil and natural gas. One-third of our manufactured energy now comes from oil, one-seventh from natural gas, one-half from coal, and 4 per cent from water power; practically all the water power and an increasing proportion of the fuels are converted to electricity.

"In terms of production objectives and national security, and in the light of the continuing shortages of domestic supply relative to demand, new sources and substitutes for petroleum and scarce minerals are needed," the report declared. "A synthetic-liquid-fuels program now offers the best hope for relieving the mounting pressure on our limited supply of natural petroleum. Under present federal programs about $10,000,000 annually will be spent during the next few years, not including any additional funds that may be provided to assist in the construction of plants of commercial size.

"The development of tidelands oil reserves should be so regulated that waste is eliminated as far as possible.

"Programs for a continuous appraisal of our minerals position, geologic exploration and mapping, and research on utilization of submarginal mineral deposits and substitutes should be expanded as one element of a larger program emphasizing basic scientific research. The cost of expanding these research and study programs would be about $25,000,000 a year."

New Approach Asked

There is, however, too much overlapping of legislative authority and many contradictions in procedures, administrative methods, and policies among the federal agencies, the council held, and "a new approach is needed to assure a program of national resources development that is geared into the economic needs and potentialities of the country."

The council suggested establishment of annually revised production goals as benchmarks which may be used in the appraisal of long-range government programs, and programs for the conservation and development of mineral resources "must be examined in the light of production needs for industrial and agricultural products, for energy, and for transportation."

"The present time, during which the less urgent aspects of these programs can proceed only at a slow pace, should be used for a thorough reexamination of the consistency of the programs with our national objectives, of future benefits related to present costs, of comparative urgency and usefulness of various programs, and of the best methods of procedure and organization," it stated.

Allowable Reduction Asked

HOUSTON.—Cosden Petroleum Corp. and Col-Tex Refining Co. have applied to the Texas Railroad Commission for a 1,600-bbl. per day reduction in the crude-oil allowable for Howard-Glasscock field, Howard and Glasscock counties, West Texas. Present allowable for the field is 17,135 bbl. daily.

this week

WASHINGTON—Truman administration unveils it program. . . . Oil industry escapes specific control measures. . . . ¶But President asks federal ownership of offshore oil, Government-operated synthetic-fuels program, planned development and use of energy resources. . . . ¶Also heavy spending, increased corporation taxes, Government steel plants, more controls over industry in general. . . . ¶Sets pattern of increasing paternalism, less elbow-room for free enterprise. . . .

TEXAS—Texas Legislature opens with many proposals affecting oil and gas industry. . . . School interests seek new taxes on natural gas and gasoline. . . . Unitization and tidelands measures will come up. . . . ¶Rates for drilling contractors' liability insurance going up as result of court decision and insurance board action. . . . Companies preparing to file new schedules but exact rates not yet determined. . . . ¶Hines Baker says industry spending millions to conserve casing-head gas. . . . Will complete program by 1950. . . . Federal price control and lack of unitization law are deterrents. . . .

TRENDS—After 10 consecutive weeks above the 5,600,000-bbl. mark U. S. crude production dropped to 5,468,685 bbl. for week ended January 8. . . . New Texas allowable will bring about a drop of about 182,000 bbl. daily for January compared to December. . . . After first full week affected by current allowable quotas Texas shows total production of 2,333,490 bbl. daily. . . . ¶Conforming to usual year-end high refinery activity, runs to stills for week ended January 1 set an all-time high daily average of 5,888,000 bbl. . . . High runs resulted in increase of four major products stocks of 1,827,000 bbl. . . . ¶Stocks of four major products for week ended January 1 were up more than 80,000,000 bbl. above same period a year ago. . . . Gasoline was up 10,000,000 bbl. . . . Kerosine up 8,000,000 bbl. (includes gain of 3,500,000 bbl. on East Coast and 1,000,000 bbl. for Gulf Coast). . . . Distillate was up 27,000,000 bbl. (includes 10,000,000 bbl. for East Coast and 1,000,000 bbl. for Gulf Coast). . . . Residual oil up almost 35,000,000 bbl. (includes about 20,000,000 bbl. for California). . . . ¶Normal winter temperatures seen as only hope to put life in present sluggish fuel-oil market. . . .

INTERNATIONAL—Caltex refinery building program in Western Europe will reduce Europe's dependency on Western Hemisphere for refined products. . . . Construction well advanced on 20,000-bbl. plant at Rotterdam, Holland. . . . Ambes refinery near Bordeaux, France, to be rebuilt. . . . ¶Drilling activity in Germany to be accelerated by German companies with U. S. and British aid. . . . ¶Chilean Government plans pipe line to give Spring Hill crude, now shut in, an outlet to seaport. . . . ¶Propose Philippine oil legislation to open archipelago to further exploration. . . . ¶France exceeds other countries in Europe in refinery expansion. . . .

PIPE LINES—Authority sought by Northwest Natural Gas Co. to build line to supply northwest area. . . . Hearings continue at Calgary, Alta. . . . ¶More than 70 per cent of the 270 miles of Texas Pipe Line Co.'s crude-oil trunk system along the Houston-Liberty-Beaumont, Tex., route has been taken up. . . .

REFINING—Report reveals octane ratings of premium-priced gasoline continue to increase. . . . ¶Four oil companies are among 16 firms participating in the University of Chicago's basic research program. . . . ¶Socony-Vacuum completes broad storage-tank construction program in more than 25 cities in northeastern states. . . .

First motor vehicle to climb sheep trails to the top of Green Mountain in Wyoming was this contract drill truck working with a Carter Oil Co. seismograph party out of Split Rock, 74 miles southeast of Lander, Wyo. This area, near Lost Soldier field, is one of the most active in the Rocky Mountains, and presents some of the most formidable terrain difficulties to exploratory work

Drillers' Insurance Costs Rise Under New Texas Liability Rule

by D. H. Stormont

DALLAS.—The oil-well drilling industry in Texas will have to pay more for its property damage liability insurance if coverage for possible underground property damage is included in future policies. Just what final rates will be for insuring against subsurface damage cannot be determined until each of the insurance companies makes its filings with the Texas Board of Insurance Commissioners. It is anticipated, however, that the over-all insurance bill of oil companies and drilling contractors will be somewhat higher.

Approval for the insurance companies to exclude subsurface damage liability from general property damage coverage in future policies has been granted by the Board of Insurance Commissioners, effective as of January 1. In its ruling the Board approved the underground damage exclusion endorsement form filed by the American Associated Insurance Companies, and granted its request that coverages for explosion hazards, surface damage resulting from a blowout or the cratering of a well, and underground property damage be placed on an "A-rate" basis. This endorsement is applicable to new and renewal insurance on and after January 1, 1949.

Blowout Not Covered

The insurance board further stated it was its interpretation that the blowout or cratering of a well was not an explosion as contemplated in the existing explosion exclusion provisions of property damage rules and rates. It also was the board's interpretation that existing basic manual rates did not include an appropriate "loading" for insuring against surface damage caused by blowouts or cratering.

The effect of the board's ruling will be that henceforth drilling-rig liability insurance will be written so that the basic coverage will apply only to aboveground damages which are not the result of explosions or blowouts and cratering. If the oil company or drilling contractor wishes insurance covering damages resulting from these hazards and for covering potential underground damage, they will be included in the policy on an A-rate basis.

The basic rate for general property damage insurance will be unchanged from 15 cents per $100 annual payroll for each $1,000 coverage. Each insurance company initially will file its own rates for covering underground damage and surface damage resulting from blowouts and cratering. None have been filed as yet, but some insurance officials have indicated what their rates will be initially.

One company has stated that its basic rate would remain at 15 cents per $100 payroll and that A-rate for covering the hazards of blowout, cratering, and explosion would be 5 cents per $100 for operations outside of high-pressure areas. In areas where high formation pressures are anticipated the increment would be doubled to 10 cents. These rates would represent a decrease in the driller's insurance bill for protection against these aboveground hazards as the former basic rate for explosion coverage alone was 15 cents per $100.

Rates Not Yet Set

Because of lack of experience in setting rates for covering underground damage liability, the insurance companies are somewhat undecided at this time as to what charges they will file. Some of the companies, however, are thinking in terms of basic rates of 5 cents per $100 annual payroll for each $1,000 coverage in high-pressure areas where the Railroad Commission requires 1,000 ft. of 1,000 psi.-test surface casing be set. In areas where under 1,000 ft., but still of 1,000-lb. test or better of casing is required, the rate would be reduced to 2.5 cents. In regions where the surface pipe does not have to be 1,000-lb. test the basic rate would be further lowered to 1.25 cents.

In setting up rates for both subsurface damage coverage and those for blowout, cratering, and explosion, it is highly likely that discounts in the order of 50 per cent will be allowed if the contractor or company will sign supplemental clauses that it will abide with Commission orders regarding blowout preventers and other pressure-control measures. Also, it is possible that a certain percentage of the rate charge will be subject to return if the driller incurs no damage losses.

Insofar as the amount of underground damages that will be insured, it is believed liability coverage initially will be limited to $50,000. Texas insurance companies have indicated they would not insure for greater amounts until they could get the lia-

(Continued on page 133)

Changes in Leasing Regulations Announced

WASHINGTON.—A number of miscellaneous amendments to the Interior Department's leasing regulations were announced last week by the Bureau of Land Management.

The most important change, bureau officials said, is the lifting of the 1-year time limit upon the filing of elections by lessees as to whether they want their leases brought under the amended leasing act of 1946 or left under the original law passed in 1920. Originally, such elections were required to be made before last December 1, but the new regulations permit the filing of elections at any time before the expiration of a lease.

It is also provided that corporations no longer need file lists of all their stockholders, but must, however, report stockholders who are not American citizens or are residents in foreign countries.

Payment of a full year's rental for the land proposed to be leased will be required with the filing of an application, instead of the 6-month rental heretofore required. It was explained this change is designed to prevent speculation in the filing of applications.

Effective March 1, a $10 filing fee will be required as a service charge for processing requests for assignments of interest in leases other than those based on royalty payments.

Other new provisions require that an attorney executing a lease on behalf of a bidder must present evidence of his authority; that an operator's bond will not be accepted unless he holds an operating agreement which has been approved by the department or has such an agreement pending for approval; and no minors, except heirs of devisees of a lessee, will be considered qualified to hold a lease, and no assignment to a minor will be approved.

Motor-Carrier Safety Requirement Extended

WASHINGTON.—A further 1-year extension of the period within which privately owned motor carriers must meet certain requirements as to safety of equipment announced in an order of December 31, 1943, has been granted by the Interstate Commerce Commission because of the continued shortage of materials.

The extension through 1949 was granted at the request of the American Petroleum Institute, which explained that the continued lack of steel for equipment, parts, and materials makes it impossible for the oil industry to conform to all of the detailed safety requirements.

Many Oil Measures Due to Come Before New Texas Legislature

by Leigh S. McCaslin, Jr.

HOUSTON.—The Fifty-first Texas Legislature which convened in Austin this Tuesday is expected to consider many bills which will vitally affect the petroleum industry.

Action which is expected to receive consideration during the session includes increased taxes on natural gas, a gasoline processing tax, revision of unitization laws, seismograph shooting in unleased offshore areas, and a resolution urging affirmation of state ownership of the so-called tidelands area.

The subjects of increased taxes on natural gas and a gasoline processing tax were thrust in the public limelight last week at an Austin meeting of Texas educators. The annual mid-winter conference of Texas School Administrators, Teacher Educators, and Supervisors, "cheered loudly" when these new taxes were mentioned.

Teachers Want Taxes

Natural resource taxes were demanded by several speakers at the conference as a means of paying for an expanded public school program called for by the Gilmer-Aiken committee report. This report, in brief, calls for the following: unification of education administration in the state under a central authority, election of the state board of education instead of appointment as at present, appointment of the state school superintendent instead of election, a "basic foundation program" of education in the public schools, and a $2,400-a-year minimum salary for teachers. This program proposed by the legislative committee would involve an expenditure of $180,000,000. It will be considered by the legislature for enactment into law.

R. P. Ward, superintendent of Edinburgh schools, told the group that "8 billion gallons of gasoline leaving the state don't have a tax." He said that a 4-cent tax would bring $320,000,000 into the school fund.

W. V. Harrison, superintendent of Frost schools, recommended that "privileged oil, gas, and sulfur" pay a "just tax." He came out for a tax board designed to make sure that "the natural-gas boys pay a just share of the taxes of the state." Caso March, Baylor law professor and twice-defeated candidate for the governorship, was another leading orator at the educator's conference. He queried as to why no provision for natural-gas and gasoline taxes was made in the Gilmer-Aiken report.

State Senator James Taylor, chairman of the Gilmer-Aiken committee, was the only legislator present to defend the bill. He stated that the committee did not have authority to study the matter of taxes on natural resources. However, he did say, "I expect you'll find some of the money will come from natural resources."

It is rumored that several members of the House of Representatives are toying with the ideal of a tax of 2 cents per gallon on all gasoline manufactured in Texas. At the same time, this group would reduce the tax on gasoline consumed by automobiles from 4 to 2 cents.

(The oil and gas industry of Texas is already paying over half of the total taxes in the state. One-fourth of these taxes go into the state school fund. During the fiscal year ending last August the state received $210,000,000 from taxes on crude oil, natural gas, and their products, or 52½ per cent of the state's total revenue. For the current fiscal year, tax income on oil production alone is running at the annual rate of $98,000,000—an increase of $9,000,000 over last year. The state comptroller, George H. Sheppard, estimates that the gas-production-tax income will increase from $8,500,000 this year to $9,000,000 in the 1950-51 fiscal year. This past fiscal year it totaled $7,328,095.)

It is rumored that several bills relating the unitization of oil reservoirs have been drafted for presentation to the Fifty-first Legislature. There is a considerable difference of opinion on the subject, and a fight as to the form of the bill is expected.

A bill permitting seismograph exploration work in tidelands areas not under lease is expected to appear at the current session of the legislature. At present, oil operators are not permitted to do exploration work on offshore areas unless they already have them under lease from the state. In the minds of some, this discourages spirited bidding on offshore leases, hence costing the state money.

No offshore leases have been put up for bids since the initial sale. The school land board is believed to be holding back until the bill permitting seismic shooting is passed, the reasoning being that the state will be able to command higher prices for its offshore leases if the oil operators have a chance to do exploration work before bidding.

A resolution urging state ownership of the tidelands area is considered a sure bet by observers of the legislature. Texas and Louisiana are, of course, currently engaged in a fight with the federal Government on this question.

NORTH TEXAS A.I.M.E. ELECTS OFFICERS

New officers elected at the January 5 meeting of the North Texas section of the petroleum division of the American Institute of Mining and Metallurgical Engineers in Dallas are: Don L. Harlan, division petroleum engineer, The Texas Co., chairman; Jack A. Crichton, DeGolyer & MacNaughton, vice chairman, Dallas; I. E. Curtis, chairman of operating committee for Hull Silk pool, vice chairman, Wichita Falls; S. V. McCollum, Continental Oil Co., Fort Worth, secretary-treasurer; J. A. Slicker, Stanolind Oil & Gas Co., vice chairman, Fort Worth. New directors elected but not in the picture were: D. H. Clewell, Magnolia Petroleum Co.; L. P. Whorton, Atlantic Refining Co., Dallas; E. E. Merkt, Gulf Oil Corp.; W. D. Sorrels, Sorrels Oil Co., Fort Worth; and Tom E. Morton, Halliburton Oil Well Cementing Co., Wichita Falls. Wallace Hawkins, vice president and general counsel for Magnolia, was speaker of the evening, talking on some of the legal aspects of unitization

International

WORLD-WIDE OIL DEVELOPMENTS

Extensive Wildcat Drilling in Germany Is Planned This Year

OIL companies operating in Germany have laid plans for an extensive drilling and exploration program in 1949, projecting more than 1,000,000 ft. of hole during the year with wildcatting in the Alpine foothills in Suabia and Bavaria.

Assistance of German and British-United States military-government authorities in the program has been assured. Drilling plans anticipate approximately 525,000 ft. in wildcat sections and about 510,000 ft. in proven areas.

An agreement recently reached between the companies and the German and Allied officials provides for permits for an entire company drilling program, leaving individual wells to the judgment of the respective companies.

Exploration Encouraging

Several recent developments have encouraged further exploration in Germany. Production reached a postwar record in October with about 13,400 bbl. daily. The success in the Emsland area near the Dutch border, where production of nearly 4,000 bbl. daily in October represents an increase of about 100 per cent since the beginning of the year, has stimulated drilling on promising structures discovered by geophysical methods in the last few years.

A second seismograph, ordered in the United States by the Oil Branch of the Fuel and Power Division of the military government recently arrived in Hamburg for use in the common interest of German exploration under supervision of the German Geological Survey. The British authorities have halted for the time being the dismantling of pipe-rolling mills operated by Rheinische Roehrenwerke and Mannesmann-Roehrenwerke. These mills have received numerous orders for pipe export to the Western Hemisphere, and the German oil industry is dependent on their production.

Stepped up drilling in recent months is behind the increase in German crude production. In the first 8 months of 1948, a total of 340,000 ft. was drilled, including about 120,000 ft. for wildcats. September drilling amounted to 60,500 ft., a new high since the end of the war. About 36,000 ft. of this total was in the Emsland fields.

The 1949 program envisions drilling of deeper tests of 8,000 ft. and more. This is to take place through the entire area of Northwest Germany. New geological information on the Suabian and Bavarian areas is expected to result in drilling in these sections.

The production record reached in Germany in October was followed by a slight drop to about 13,100 bbl. daily in November, preliminary estimates show. The decline was attributed to workover operations and the fact that the month had one less working day.

Guatemalan Exploratory Rights Sought by Sohio

Oil exploratory rights are the subject of contract negotiations now being carried on between Standard Oil Co. of Ohio and the government of Guatemala. Some preliminary geophysical work has already been conducted with exploratory drilling planned for 2,000,000 acres upon ratification of the contract by the government with approval of President Juan Jose Arevalo.

If oil is discovered, production would be limited to a small area, with the government retaining ownership rights underground, as well as supervisory control of the enterprise. Under terms of the contract now being discussed, Sohio would receive seven-eights of the production.

Jungle terrain necessitates air transportation of all drilling equipment, requiring construction of an inland landing strip, and a pipe line would have to be laid to Puerto Barrios on the coast for transportation of any oil produced.

Emsland Field Boosts German Output

WASHINGTON.—German oil fields now are producing crude at the rate of 650,000 tons a year, compared with a 1936 production of 445,000 tons, it was reported to the War Department last week by the Bipartite Commerce and Industry Group at Frankfort.

The chief reason for the large postwar increase, the report stated, was the opening of Emsland field, near the Dutch border, during the early part of the occupation, but the Hannover fields are producing more than before the war. Other major Bizonal fields are located at Reitbrook, near Hamburg, and Heide, in Schleswig-Holstein.

"Although production is much higher than before the war," it was stated, "more than 70 per cent of Bizonal Germany's consumption must be imported." These imports are paid for from funds made available by the Economic Cooperation Administration, Joint Export-Import Agency, and Government Aid and Relief in Occupied Areas, and amount to $55,000,000 annually. In addition, another $10,000,000 of ECA funds is programed during the fiscal year for oil-producing and refining equipment.

Bizonal refineries operating on German crude are producing 90,000 tons of gasoline, 75,000 tons of diesel oil, and unspecified amounts of lubricants and other products annually. Bizonal consumption, however, requires also the importation annually of 325,000 tons of gasoline, 578,000 tons of crude, and 625,000 tons of diesel oil, it was stated.

Chilean Pipe Line to Provide Spring Hill Production Outlet

WITH six oil wells now completed and several promising structures scheduled for further testing, the Chilean government corporation handling the development in Tierra del Fuego is proceeding with its plans to provide a pipe-line outlet to a tanker-loading terminal by the end of the year.

The area became the world's most southerly oil field following the discovery at Cerro Manantialles (Spring Hill) in December 1945. To date, 17 wells have been drilled in Cerro Manantialles, but production has been shut in pending an outlet to the coast.

Corporacion de Fomento de la Produccion, which is in charge of the Tierra del Fuego oil development along with various other Chilean projects, now has three rotary rigs running in the area, and a fourth is being purchased.

Two of the rigs are running in Cerro Manantialles field, and the third is now drilling the San Sebastian structure about 50 miles to the south. Of the 17 wells drilled in Cerro Manantialles, besides the six oil producers, three produced gas and small amounts of oil, four were gas with distillate, two were strictly gas wells, and two were dry.

Potential Is 3,000 Bbl. Daily

Cerro Manantialles is about 7 miles from the coast north on the Straits of Magellan. Producing potential of the shut-in field is estimated at possibly 3,000 bbl. daily. Producing depths range around 7,500 ft., and the exact form of the geological structure is still undecided. Gravity of the crude is about 40°.

One well has been completed on the San Sebastian structure. It yielded water with about 10 per cent 32°-gravity crude with the same sand as at Cerro Manantialles found at about 7,000 ft. The outcome of the second test now being drilled will determine if the program in this area is to be continued.

Also scheduled for early test drilling is the Espora structure about 7 miles north of Cerro Manantialles. A well drilled here early in 1948 found water and apparently the same producing sand with some oil shows. Drilling also is planned on the Cerro Sombrero structure about halfway between Manantialles and San Sebastian.

The Chilean corporation has two seismograph parties in the field and is doing considerable geological work as a part of its exploration and development program. One of the two seismograph parties is operated by United Geophysical Co. Hoover, Curtice & Ruby, Inc., did the early geological work leading to the Cerro Manantialles discovery.

The pipe-line outlet for the Cerro Manantialles production will extend west from the field about 45 miles to a cove, Caleta Clarencia. Construction equipment to build the 8-in. line has been purchased, and much of it shipped. Williams Brothers Co. has done the engineering work for the line. One pump station is to be built at the field, and under present plans, some of the pipe for the line may be rolled in a new Chilean mill now being built.

Construction of the marine terminal at Caleta Clarencia already is under way. A total of 215,000 bbl. of storage is planned, consisting of one 55,000-bbl. and two 80,000-bbl. tanks. Marine loading facilities also will be provided.

George Livermore, Lubbock, Tex., drilling contractor, was engaged in the early phases of the development. At present, Livermore is providing key personnel for supervision only, consisting of two tool pushers and eight drillers. The corporation bought Livermore's Wilson Atlas rig. The other three rigs, including the one being delivered, are Wilson Titans. The new rig, when in operation probably by the middle of 1949, will be handled by Chilean personnel.

The Chilean Government also has plans for the construction of a refinery on the central Chilean coast. Some preliminary engineering work for this plant is expected to be carried out during the coming year.

Philippines Seek U. S. Reaction to New Oil Law

DEMETRIO ANDRES, director of the Bureau of Mines of the Republic of the Philippines, and Pascual Bautista, attorney for the bureau, are now in the United States for discussions in connection with the republic's proposed new oil law.

Andres and Bautista expect to leave Washington the end of this week to visit field operations in the Southwest and will be in Tulsa and Houston. They plan to go to Mexico City and return later to San Francisco where they will leave for the Philippines about February 10.

International
WORLD-WIDE OIL DEVELOPMENTS

Andres came to the United States from Europe following the International Geological Conference. In the United States he and Bautista are getting reactions to the proposed legislation which is expected to open up the archipelago to further oil exploration. The law is expected to be submitted to the new Philippine Congress convening January 22.

At present, Philippine Oil Development Co., Inc., is exploring three concessions obtained under the old oil law which was suspended in 1939. Colonel Soriano, president of the company, recently told stockholders of the company in Manila that the well being drilled on the Bondoc lease in southeastern Luzon appeared to be "close to commercial production." He said, however, fine shale packed slightly against the casing appeared to be preventing the continuous flow of oil. He also told the meeting that drilling operations at the company's Daanbantayan lease in Cebu were to be resumed following a geophysical survey in the area.

Refining Progress in France Lauded by Levy

FRANCE has made more rapid progress than any other country in Europe in increasing petroleum refining capacity, Walter J. Levy, chief of the Economic Cooperation Administration's Washington Petroleum Branch, told the French Society of Petroleum Technicians at a recent meeting in Paris.

"The progress of the French refining industry has relieved the overstrained refining capacity outside Europe from a burden it would have had otherwise to carry," Levy said.

Jean Monnet, chief of the French Industrial Planning Board, in a report on results of the Monnet Plan for the first half of 1948, said refinery capacity in the country was at 11,200,000 tons a year (about 225,000 bbl. daily) June 30, against 4,000,000 tons (about 60,000 bbl. daily) at the beginning of 1947. Capacity is now about 12,000,000 tons (240,000 bbl. daily).

The Benelux countries of Belgium, Holland, and Luxembourg, in a recent memorandum to the ECA in Paris outlining recovery plans, reported international oil companies are planning to establish in the Benelux countries refineries to process about 6,500,000 tons a year (about 130,000 bbl. daily) compared with 2,500,000 tons a year at present.

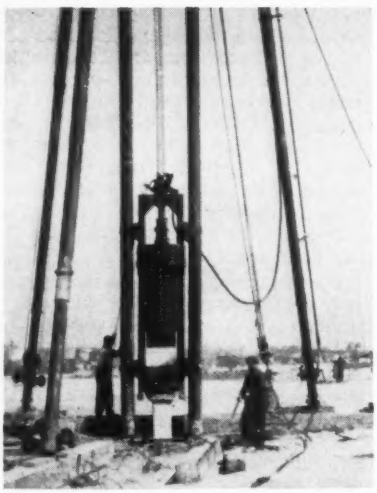
New Caltex Refineries in Holland And France Will Be Ready in 1950

A PROGRAM of refinery construction in Western Europe is well under way by California Texas Oil Co., Ltd., designed to process Middle East crude and reduce Europe's dependence on the Western Hemisphere for refined petroleum products.

Construction is already well advanced in Holland where Caltex Petroleum Maatschappij, N.V., is building a 20,000-bbl. daily refinery at Pernis, a suburb of Rotterdam, situated on the Niewe Maas River. This refinery is destined to help supply the needs of the Benelux countries, and its completion is now expected in February 1950, at which time runs of motor gasoline, illuminating and power kerosine, diesel fuel, and fuel oils will begin.

Being built by Arthur G. McKee & Co., Cleveland, this modern plant will process crude by the newest approved scientific methods from the initial distillation to the finished products. The Pernis refinery will consist of a two-stage crude unit, a 6,500-bbl. daily thermal reformer, a 6,400-bbl. daily Dubbs thermal cracking unit, a nonselective polymerization unit capable of producing 900 bbl. daily of polymers, a 1,600-bbl. daily Edeleanu SO_2 extraction plant, and the necessary treating and finishing facilities. In addition, a complete laboratory, work-shops, offices to accommodate a staff of 50, a warehouse, cafeteria, locker room, and firehouse will be erected. The cafeteria will serve a midday meal to 200 employes. There will also be a complete first-aid station maintaining its own ambulance.

International
WORLD-WIDE OIL DEVELOPMENTS



Driving piles at the site of the Pernis refinery. Soil conditions make necessary 40 to 90-ft. piles to support all major equipment

Three houses are being constructed on the refinery site for key operating personnel. Accommodations for 260 families are being arranged for refinery employes in a new housing project under construction in the nearby municipality of Vlaardingen. The refinery expects to employ around 350 persons.

Being constructed on 104 acres of reclaimed land, the Pernis refinery has presented many problems to its engineers. Soil conditions are such that all major equipment must be supported on piles varying in length from 40 to 90 ft. The entire installation will require 2,500 reinforced concrete piles each 15 in. square. Settlements up to 18 in. are expected to occur during early years as the result of soil consolidation in recent fills which produce many difficult problems in the planning of pressure water lines, sewer lines, and other underground piping.

Storage tanks up to a maximum of 10 meters in height (about 33 ft.) are being supported without the use of piling. Soil consolidation beneath these tanks is expected to reach a maximum of 65 in. Sand pads are being placed under each tank equal to the estimated amount of consolidation.

Storage facilities will be provided for approximately 1,600,000 bbl. of crude oil and petroleum products. Crude will be received from a deep-

Shown here is the powerhouse at the Ambes refinery. Existing steam and electric-producing facilities suffered little war damage

water wharf, adjacent to the site. At a second wharf, barges will be loaded with finished products up to the rate of 3,500 bbl. per hour.

The steam generating plant contains two high-pressure boilers, each capable of generating 150,000 lb. per hour at 250 psi. and 750° F. total temperature. Water from the Rotterdam municipal system is fed into the boilers after having been treated by a hot-line and soda process. Air compressors, located in the boiler house, will furnish 2,000 cu. ft. per minute of utility air to the refinery at 100 psi. and 1,500 cu. ft. per minute at 50 psi. for process-control instruments. The thermal cracking-unit steam generators will produce from waste heat an additional 45,000 lb. per hour of steam at 165 psi. and 450° F. total temperature.

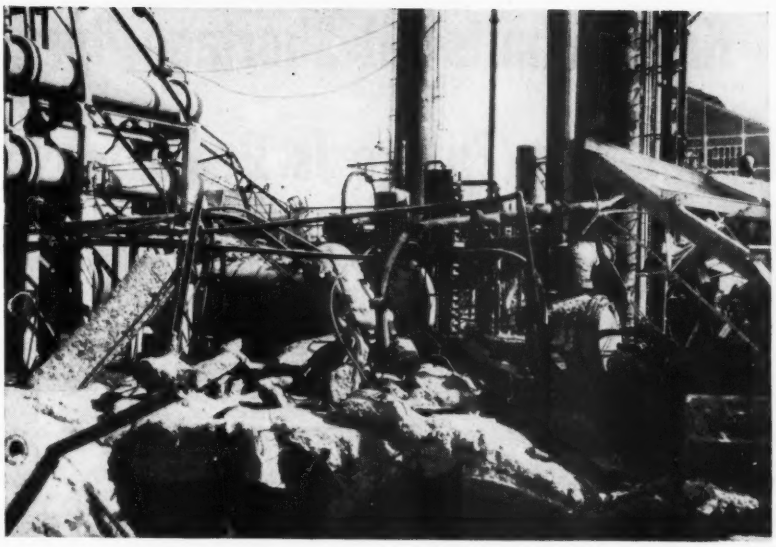
A pumping station will supply 864,000 gal. of cooling water per day for the refinery from the Niewe Maas River. The cooling water pump drivers are designed to operate on low-pressure steam. As the requirements for low-pressure steam for heating purposes increase during the winter months, a maximum of 3,600 lb. per hour can be bled from the pump driver turbines and supplied to the refinery. During the warm summer months, low-pressure steam not used for heat purposes will be fully utilized by the pump-driver turbines as the demand for cooling water reaches its maximum. An additional pumping system will produce 2,500 gal. of water per minute at 150 psi. for fire protection.

The Pernis refinery will require an estimated 20,000,000 kw.-hr. of electrical power per year, to be purchased from the Rotterdam municipal system.

Rebuilding Ambes Refinery

To help restore the French economy, the Caltex affiliate, Raffineries de Petrole de la Gironde, is virtually rebuilding the Ambes refinery near Bordeaux. The work here, also being done by Arthur G. McKee & Co., is already one-quarter finished, and is expected that early 1950 will see its completion.

The rebuilding of the Ambes refinery will require the construction of a completely new 13,000 bbl. daily atmospheric crude distillation unit and the reconstruction of the war-damaged thermal reforming unit to an increased postwar capacity of 3,200 bbl. daily. Most of the remaining refinery units are being repaired or reconstructed without major additions or changes. The refinery has been so designed as to permit the addition of cracking facilities at a later date. Existing steam and electric-producing facilities suffered little damage during the war and are being reconditioned to furnish 111,000 lb. of steam and 1,300 kw. of electricity. . . .



Because of the extensive war damage the Ambes refinery near Bordeaux must virtually be rebuilt. Already one-quarter finished, it is scheduled for completion in early 1950

A new pumping station, utilizing many of the prewar pumps, will supply cooling water at the rate of 10,000 gal. per minute from the nearby Dordonne River.

Storage Bombed Out

Storage facilities especially suffered wartime bomb damage. Only 412,000 bbl. storage capacity remains usable or repairable. When completed, the Ambes refinery will have a total storage capacity of 1,350,000 bbl.

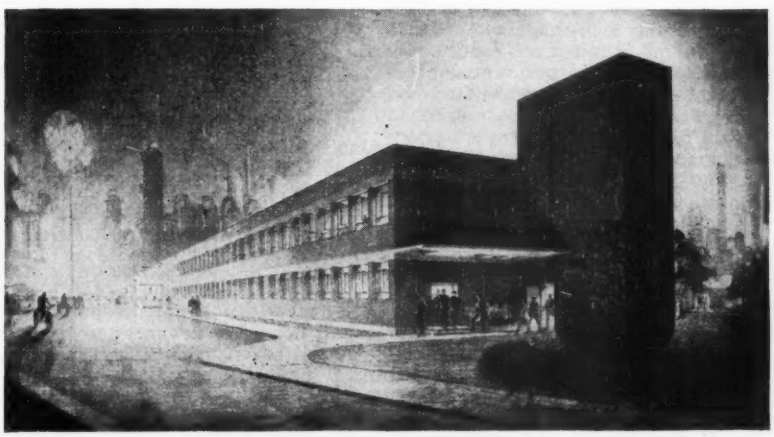
All crude oil for the refinery will be received, and some of the finished products shipped from an existing public wharf. The local port authorities are constructing an additional wharf to handle the balance of the finished refinery products.

Requiring housing for its estimated 325 employes, the refinery, with the cooperation of local housing authorities, is providing suitable housing facilities for employes and their families. Twenty-two residences, a club house, and a cafeteria capable of serving 300 are under construction. The cafeteria will obtain a part of its food from its own gardens planted in unused areas of the refinery site reserved for future expansion.

Italian Investments Considered

As the demands of the European economy become more clearly defined, Caltex will take its share of responsibility in developing additional refineries and facilities in other friendly nations. Consideration is being given to investments to serve the needs of Italy, and further activities in other countries may be anticipated.

International
WORLD-WIDE OIL DEVELOPMENTS



Drawing of office building to be constructed at the Pernis refinery. Offices will accommodate a staff of 50

Krug Admits Oil Shortage Over But Says Future Is Precarious

WASHINGTON. — Secretary of the Interior J. A. Krug admitted last week for the first time that there will be an adequate supply of oil this winter, but insisted there has been no great improvement in the long-range picture, in that connection putting in a plug for his synthetics-development program.

As recently as November 19, Krug expressed fears of a recurrence this winter of the shortage of heating oils that necessitated the adoption of the industry's first voluntary allocation agreement a year ago.

At that time, appealing to the steel industry to make a formal agreement to allocate steel for tubular goods, Krug declared he dared not eliminate the industry's voluntary agreement, the state oil coordinators, the presidential order to government agencies to save oil and gas and prevent conversions from other fuels, the export controls on oil, or the Government's appeals for conservation because, he said, while supply and demand were in approximate balance, "the balance is precarious."

Last week, however, the Secretary announced that "in view of the adequately high stocks of petroleum products there is no reason at this time to renew his public appeal of last winter for reduced oil consumption." Accompanying that statement was an expression of appreciation for the cooperation given last winter by the oil industry, the manufacturers of consuming equipment and the public, and the National Petroleum Council.

Long-Range View Dim

"However," a statement issued by the Oil and Gas Division continued, "there has been no material improvement in the long-range picture and the United States may continue to be in a precarious position in oil if present strenuous efforts to find and bring into production new sources of liquid fuels, including synthetics, are not vigorously prosecuted.

"The improvement in the petroleum supply and demand situation in the past 6 months has exceeded the expectations of Government and industry. While the primary cause is a steadily increasing supply, a considerable part of the improvement came as a result of the response of consumers, the oil industry, and the manufacturers of oil-consuming equipment to the secretary's appeal. The delay in new installations of oil-burning equipment and emphasis on the replacement of inefficient with efficient units were of substantial value in easing the shortage and in slowing down the rate of increase in demand.

"Conservative use of oil saves the consumer money and at the same time lessens the drain on an invaluable national resource."

The OGD reported that stocks of most products are not only considerably higher than last year in terms of barrels, but also are higher in number of days' supplies on hand, the latter a development of the last few months. But the division also pointed out there is still almost no reserve domestic productive capacity, and the improved situation reflects increased domestic output as well as increased imports, combined with export restrictions.

Bureau of Mines estimates placed the year-end stocks of refined products at 340,000,000 bbl., 74,000,000 bbl. above December 31, 1947. The greatest gains were 28,000,000 bbl. of residual fuel oil, 27,000,000 of distillate fuel oil, and 9,000,000 of gasoline. Stocks of crude were estimated at 245,700,000 bbl., 15,000,000 bbl. above 1947.

New Foreign Exploration Company Formed by Three U. S. Firms

A NEW organization, Conorada Petroleum Corp., has been formed by three leading crude-oil producing companies of the United States for the purpose of exploration for development of foreign properties. The three companies are Continental Oil Co., Ohio Oil Co., and Amerada Petroleum Corp., none of which has engaged in foreign operations in the past.

A. A. CURTICE

Arthur A. Curtice, formerly head of Hoover, Curtice & Ruby, S.A., of Venezuela, which now has been dissolved, has been named president and in direct charge of operations of the new company. Curtice is an internationally known consultant in geology and petroleum engineering and has been associated with Hoover, Curtice & Ruby, Inc., and its affiliates, which have served as technical advisers to numerous foreign governments in Latin America and in the Middle East and in the formulation and drafting of petroleum legislation for such governments. The name of Hoover, Curtice & Ruby, Inc., which continues in business, has been changed to Exploration Contractors, Inc.

Conorada Petroleum Corp. was formed with a nominal capitalization, with necessary advances to be made by the parent companies for geological exploration outside the United States and to conduct negotiations for the acquisition of prospects considered to be favorable for the production of oil. Actual acquisition of prospective property and the subsequent development will be carried on either by the parent companies direct or by subsidiary companies to be organized for that purpose.

The directors of Conorada include: L. F. McCollum and James J. Cosgrove, Continental Oil Co.; J. C. Donnell II and W. B. Emery, Ohio Oil Co.; and A. Jacobsen and E. H. McCollough, Amerada Petroleum Corp.

Mississippi Oil Board Adopts New Rule Changes

Two rule changes recently adopted by the Mississippi Oil and Gas Board include (1) dropping the provision which requires the keeping of transcriptions of all records of hearings, and (2) authorizing production quotas to be set each 2 months instead of monthly.

The board set the January allowable for Gwinville gas field at 6,150,400,000 cu. ft. and at 5,555,200,000 cu. ft. for February.

Index Ready Soon

The complete editorial index of The Oil and Gas Journal for 1948 is now in preparation and will soon be ready. The complete index, enlarged and improved and with more cross-references, bound separately, will be sent without charge to all subscribers requesting a copy. Address requests to Circulation Department, P.O. Box 1260, Tulsa.

WASHINGTON WATCHING

BY BERTRAM F. LINZ

Congress Gets Set

WASHINGTON. — The Democratic leadership in Congress has so rigged House and Senate committees as to give the majority party practically assured control over legislation, but there is no reason to believe this action will make smooth sailing for President Truman's lengthy "must" program.

Observers in Washington believe that this could be the most independent Congress in years, pointing out that the Democrats did not ride into office on President Truman's coattails, since he was popularly considered a dead duck, but won their seats by their own efforts.

Equally to the point, a lot of the legislation proposed by the administration will have local angles which the individual members will have to consider—tidelands as an example—and instances are relatively rare where a member of Congress deliberately invited defeat for reelection by supporting an administration measure unpopular in his own bailiwick.

To cinch their hold on the upper house, the Democrats changed the ratios on several important committees to give themselves more members and the Republicans fewer. The loudest criticism came when the ratio on the Foreign Relations Committee was changed from seven to six to eight to five, which the Republicans charged was a political move that eliminated all chance of continuing the bipartisan foreign policy which they maintained during their control of Congress.

The ratios on the banking and currency committee, interior and insular affairs, interstate and foreign commerce, and judiciary, which will handle legislation applying to the oil industry, were similarly changed, and that of the appropriations committee was upped from 12 to 9, to 13 to 8.

There were no deviations from the seniority rule in selecting the chairmen for the committees in charge of oil matters except in the case of the banking and currency committee, where Sen. Robert F. Wagner of New York, who is in poor health, voluntarily stepped aside in favor of Burnet R. Maybank of South Carolina. Sen. Kenneth McKeller of Tennessee will head the appropriations committee, Walter F. George of Georgia the finance committee, and Tom Connally of Texas the foreign relations committee. Interior will come under Joseph C. O'Mahoney of Wyoming, interstate commerce under Edwin C. Johnson of Colorado, judiciary under Pat McCarren of Nevada.

In the House, the Democrats handpicked the men who will be added to the various committees, but the most important change was the clipping of the power of the rules committee to prevent measures reaching the floor. Under an amendment of the rules, if the committee refuses to give a measure right-of-way within a period of 21 days the chairman of the committee in charge of the bill may go directly to the House for permission to call it up.

Slants on Steel

THE United States steel industry wound up the year with a peacetime high production of 88,500,000 tons and immediately started out to build up a new record in 1949, hoping to surpass 90,000,000 tons.

This country provided well over half of the world's production of 168,000,000 tons of steel, but both domestic and world production fell far short of demand.

Steelmakers admit that it is up to the industry now to prove its contention that existing steel capacity is adequate to take care of the country's long-term needs, or face the practical certainty that the Government will build additional plants. Government economists contend there should be more than 100,000,000 tons capacity, and President Truman, in his initial message to Congress, asked for a study to determine whether additional plants are needed.

From the standpoint of the oil industry, steel capacity could stand considerable upping, at any rate in the tubular-goods division. That thinking may be important when, if Public Law 395 is continued, new attempts are made to secure voluntary allocation agreements.

Here are a couple of other angles on the steel situation.

Present automobile designs may carry over for several years, with a view to making manufacturing economies and conserving raw-material supplies.

The area of low-priced steel in this country is drawing to a close with the depletion of the great Mesabi reserves, and it will be necessary to undertake the mining of low-grade ores and import ore from Canada and Venezuela; within a decade the relative cost of iron ore per unit may be half again as much as it is now.

Tanker Troubles

THE Maritime Commission is pressing the Navy for return of 57 tankers, all but two of them T-2's, in order that it may dispose of them to private operators and wipe its slate clean.

The vessels were turned over to the Navy during the latter half of 1947 to meet military requirements which could not be handled with the regular Navy fleet. Many, if not all, are being operated for the Navy under contract, and it is the Maritime Commission's philosophy that all shipping that is suitable for commerce service should be in commercial hands.

Figures compiled by the National Federation of American Shipping place the privately owned United States tanker fleet at 497 vessels with a capacity of not quite 7,000,000 deadweight tons, compared with 384 tankers of 4,256,000 tons in 1939.

The federation pointed out that while the aggregate tonnage of American shipping is satisfactory as compared with a decade ago, the fleet is unbalanced by a deficiency in fleet tankers and bulk oil carriers for national defense. The Navy also has emphasized this shortage, urging the construction of 20 vessels of about 250,000-bbl. capacity and a speed somewhat above 20 knots, and Standard Oil Co. (N.J.) which last year secured bids on such vessels is understood now to be studying new figures which may lead to the letting of a contract.

The cost of the large-capacity, high-speed tankers was estimated last year at around $7,000,000 toward which it was proposed the Government should contribute $2,000,000 as the cost of national-defense features. Oil companies, however, are not too interested in these vessels, since their deep draft makes them impractical for shallow-water ports and they require more fuel for operation than the conventional T-2, which costs around $3,000,000 to build and has a capacity of about 155,000 bbl. There are about 68 such tankers now under construction or contracted for.

Maniac Almanac

THROW away the calendar—there are going to be 107 weeks in 1949, and there will be 7 months, too, that can't be found in any almanac.

This month, for instance, there will be Idaho Potato and Onion week, Jaycee week, Large Size week, Na-

tional Service week, National Coin Machine week, Printing week, National Thrift week, and get your needles out for National Crochet week.

February will be Linen month, and will have National Fig week and National Hot Tea week, National Cherry week and National Sew and Save week, among others.

If you like such things, Table Tennis week comes in March, coincidentally with National Save Your Vision week, and April 1-8 will be National Laugh Week and National Leave Us Alone week, and you can take your choice. The week following will be both National Baseball week and National Peanut week, which looks like a frameup. The same month will bring Honey for Breakfast week and National Want Ad week, National Coin week, National Fishermen's week, National Pharmacy week, and National Donut week along with, whatever it may be, a 12-day "Sleep Show."

May 1-7 will be National Baby week and National Noise Abatement week, and any parent knows you can't have both, along with National Family week and Be Kind to Animals week. National Golf week will include Humane Sunday. The summer version of Hot Tea week is, of course, Iced Tea week. There is Cat week, Dog week and Save-the-Horse week; Sweater week and Tie week; Cranberry week and Wine week.

All these weeks and more, plus seven special months and several hundred days, have been neatly compiled by the Department of Commerce in a bulletin designed to assist businessmen in coordinating advertising and other promotional plans with such events.

Everybody seems to have carved out a special place on the calendar except the oil industry. How come there's no Grease the Jalopy week, Buy a Gallon of Gas week, or Drill Another Well month?

Bill Introduced to Clarify Pricing Policies Challenged by FTC Program

WASHINGTON.—The first concrete step toward eliminating the confusion resulting from the Supreme Court decision in the Cement Institute case was taken last week by Sen. Edwin C. Johnson of Colorado, new chairman of the Interstate Commerce Committee, who introduce legislation in Congress designed to permit manufacturers to adopt whatever pricing policy they please, provided no conspiracy to fix prices is involved.

Under the court decision, some members of the Federal Trade Commission took the position that any pricing policy other than f.o.b. mill would be subject to attack, and some 50 industries which would be affected by such a policy called on Congress for relief.

In introducing his bill, Johnson told the Senate it was not a perfected measure but was designed to provide a basis for further hearings by the trade policies subcommittee which went into the question last year when Sen. Homer E. Capehart of Indiana was chairman.

The bill, he said, will free sellers to elect the pricing policy they will follow, permitting them to absorb transportation costs when necessary to meet competition in distant markets or to sell their products at the same prices to all buyers throughout the country.

At the same time, he explained, it gives additional power to the Federal Trade Commission to enforce its orders against conspiracies, and whenever the commission found a group of sellers guilty of conspiring to fix prices, it could not only issue the usual "cease and desist" order but could require each respondent to have an f.o.b.-mill price for all of his products and to give buyers the choice of buying at either the f.o.b.-mill price or at a delivered price which could not be more than the f.o.b. price plus the actual transportation to the buyer.

Johnson pointed out that his bill eliminates any possible interpretation that individual businessmen are required to sell at f.o.b.-factory prices. To eliminate any chance that the word "price" as used in the antitrust laws shall be defined as the seller's mill net return, as contended by the FTC, the bill defines the word as being what the buyer and seller agree to be the price.

800 German Oil Patents Available for Licensing

WASHINGTON. — The Department of Justice last week made available for licensing more than 800 patents and patent applications dealing with oil and chemicals which were seized by the Alien Property Custodian in 1942 as property of I. G. Farbenindustries, A. G.

The department's action was made possible by Federal court decisions denying the claims of Standard Oil Co. (N.J.) and its affiliates to the patents, on the grounds they were based upon transactions whose real intent was to cloak German ownership. The companies, however, were allowed to keep exclusive rights in certain fields which they had acquired in 1929, subject to the terms of the antitrust consent decree issued against the companies in 1942.

During the pendency of the litigation, the patents and patent applications were licensed only on a provisional basis, but they now will be offered generally. Licenses under some of the patents may be obtained either from the Office of Alien Property or the Standard companies, others from the companies only. Outside of certain fields of use, licenses will in general be royalty free, but for use in petroleum and oppanol fields the companies will be entitled to charge reasonable royalties in accordance with the terms of the antitrust decree.

The patents cover a wide range of processes and apparatus relating to the production of various petroleum products, oppanol (useful in increasing the viscosity of lubricating oils and in making insulation), synthetic rubber, and various chemicals including toluol, hydrogen, and synthetic detergents.

Few Oil Bills Presented In Opening of Congress

WASHINGTON.—Only a handful of bills affecting oil were introduced in the opening days of the new Congress, about half of them dealing with the ownership of the tidelands.

However, the measures submitted at the opening of a session generally include few administration bills of importance. Except for tidelands, accordingly, the major measures affecting the oil industry directly are yet to be proposed.

Bills declaring title to the tidelands to rest in the states were introduced in both Senate and House, and in the latter, also, Rep. Emanuel Celler of New York put in the administration bill for federal operation sponsored last session by Sen. Alben W. Barkley of Kentucky. The state-ownership bills were submitted by Sen. William F. Knowland of California and Congressman Ed Gossett of Texas, Hale Boggs of Louisiana, Robert Hale of Maine, Gordon L. McDonough of California, and Olin E. Teague of Texas.

Other legislation introduced included bills dealing with synthetic-liquid-fuel development by Sen. Pat McCarran of Nevada and Rep. Charles A. Wolverton of New Jersey. An oil-pollution bill was put in by Rep. Schuyler O. Bland of Virginia, and a bill to amend the Natural Gas Act was submitted by Rep. John E. Lyle of Texas.

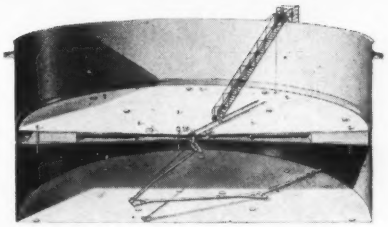
Rep. Mike Mansfield of Montana put in a bill providing for publicity of the pricing policies of certain corporations.

THE HORTON DOUBLE-DECK FLOATING ROOF

. . . your best bet for low-cost storage

The Horton Double-Deck Floating Roof is designed to furnish the petroleum industry with an economical and dependable means of storing volatile liquids. Its purpose is to prevent evaporation losses and to reduce the danger of fire. The Horton Floating Roof does both of these jobs at once, as it eliminates the vapor space where evaporation takes place, and where fire is most likely to occur. The roof floats directly upon the surface of the stored liquid.

The Horton Double-Deck Floating Roof is widely used at refineries, storage terminals, pipe line stations, and natural gasoline plants. It can be installed on new or existing flat-bottom tanks, and is particularly recommended for use on those tanks which are filled and emptied more than six times a year. For complete information, write our nearest office for Bulletin B.



The top view shows a Horton tank equipped with a Horton Double-Deck Floating Roof at the Arkansas Fuel Oil Company's Birmingham terminal. Two grades of gasoline and kerosene are delivered to the terminal by the Plantation Pipe Line, and are shipped by truck and tank car to dealers in the Birmingham area. Directly above: Cutaway view showing construction features of a Horton Double-Deck Floating Roof.

CHICAGO BRIDGE & IRON COMPANY

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PENNSYLVANIA

Atlanta, 3—2154 Healey Bldg.
Birmingham, 1—1536 North 50th St.
Boston, 10—1025-201 Devonshire St.
Chicago, 4—2128 McCormick Bldg.
Cleveland, 15—2204 Guildhall Bldg.
Detroit, 26—1514 Lafayette Bldg.
Havana—402 Abreu Bldg.
Houston, 2—2119 National Standard Bldg.
Los Angeles, 14—1423 Wm. Fox Bldg.
New York, 6—3347-165 Broadway Bldg.
Philadelphia, 3—1615-1700 Walnut Street Bldg.
Salt Lake City, 1—1525 First Security Bank Bldg.
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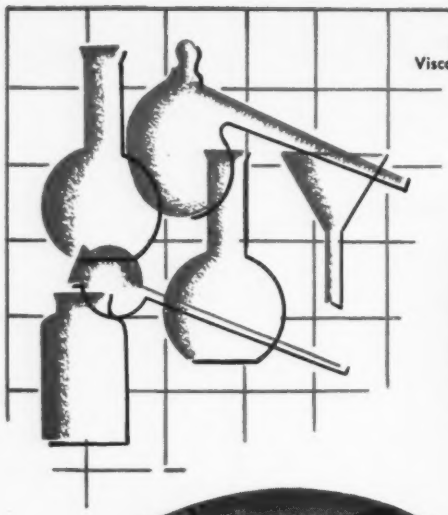

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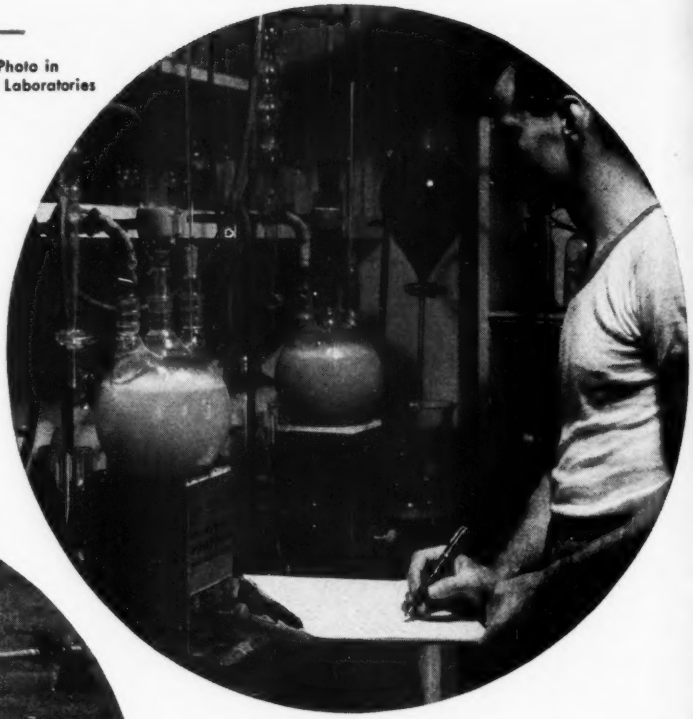

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NOTICE: Visco Products Company is authorized to manufacture and sell Visco Oil Treating compounds for use in the breaking and resolving of oil emulsions, and to grant licenses for such use, under the following United States patents: 1,860,562; 1,860,563; 1,912,330; 1,937,259; 2,060,639; 2,060,640; 2,206,589; 2,214,783; 2,214,784; 2,225,189; 2,303,414; 2,307,813; 2,318,034; 2,318,035; 2,321,056; 2,336,554. Re. 20,717 and patents pending. Any purchaser of Visco Oil Treating compounds is authorized to use the same in the treating, breaking and resolving of oil emulsions in accordance with the above patents. The royalty for such use is included in the purchase price. Visco Products Company is authorized to and is willing to grant licenses on a royalty basis, to all companies, and to others desiring to practice the patented subject matter, under any and all of the above patents, permitting the user to purchase the oil treating compounds at will from any vender, and to prepare the compounds for use under the above patent or patents, at a royalty charge of 20 cents per gallon. Application for license should be made to **Visco Products Company**, Houston, Texas.

Oil Agencies Get More in Budget; Start on Synthetics Plants Asked

WASHINGTON.—President Truman this week asked Congress to provide financial assistance to encourage commercial production of synthetic liquid fuels, but made no specific recommendation as to the amount to be provided nor the form such government aid should take.

The proposal was included in the President's annual budget message, in which he reiterated his recommendation for legislation to provide for "proper conservation and planned use of the oil reserves under the sea which are vested in the federal Government."

"The country must face squarely the fact that a major portion of its rapidly increasing energy requirements is being met by oil and gas, which constitute only a small portion of our energy reserve," he said. "The prospects are that we shall become increasingly dependent on foreign sources of oil unless appropriate action is taken."

The budget for the coming fiscal year calls for expenditures of 42 billion dollars, about 1.7 billion, the President estimated, above the requirements for the present year but, he warned, expenditures in the fiscal year 1951 are likely to be still larger.

With the exception of funds for synthetic-fuel development and one or two other proposed projects, the President threw into the budget estimates for practically all the new programs he has in mind to make a start on socialized medicine, low-cost housing, aid to education, etc.

Oil Taxes Yield More

The proposed appropriations for oil and gas activities of the Government run into many millions of dollars, but the total is only a fraction of the nearly $650,000,000 which the Treasury estimates it will secure during fiscal 1950 from the three oil taxes and other federal oil revenues.

Budget tables showed that the Treasury expects to collect $536,000,000 from gasoline during the year, as compared with an estimated $509,000,000 for the current year; $80,000,000 from lubricating oils against $82,000,000, and $21,000,000 from transportation of oil by pipe line against $20,000,000. For the fiscal year ended last June 30, those taxes returned $478,637,625, $80,886,922, and $18,773,045, respectively.

As a result of the Government's own activities it is estimated that $2,560,000 will be secured from mineral leases on the public lands, the same as now estimated for this year, against an actual of $1,925,044 in 1948. Another $17,500 will be derived from pipe-line rentals, also the same as this year, from which $16,250 was secured in 1948. Royalties will include $1,875,500 from the naval petroleum reserves in California, against $1,139,754 in 1948; $505,200 in other royalties on oil and gas, against $504,188; and $50,000 from oil, gas, sulfur, and other minerals from the national wildlife refuges, against $63,225. Receipts from helium sales by the Bureau of Mines are estimated at $470,000, against an estimated $460,000 this year and an actual $291,736 in 1948.

Increase for OGD

The budget raises the appropriation for the Oil and Gas Division from this year's $325,000 to $400,000, of which $175,000 (this year $165,120) would be for enforcement of the Connally "Hot Oil" Act, and $203,100 (this year $142,380) for coordination of oil and gas activities.

The Bureau of Land Management would be given $3,792,500 for its protection and disposal of public lands, as compared with $3,000,000 for the current year, of which $599,574 (against $525,000) would be for surveying the public lands; $517,000 (against $425,000) for land offices and adjudication, and $340,000, the same as this year, for examination and classification of lands.

An increase of nearly $4,900,000 is proposed for the Geological Survey, which would be given $17,900,500 against its present appropriation of $13,027,500. Seven million dollars would be provided for topographic surveys, against the current $4,350,000, and $3,500,000 for geologic surveys, against $2,625,000, of which $202,000, the same af this year, would be for geochemistry and petrology, $143,960 for general geology, $93,000 for engineering geology, and $347,000 for geophysics.

The survey also would get $500,000 for investigation of the mineral resources of Alaska, for which $325,000 was provided this year, and $746,000 for administration of the leasing laws, of which $512,000 would be for the oil and gas leasing division, which received $505,000 this year.

As a result of the completion of the synthetics-fuels demonstration plants for which funds were provided this year, the appropriation for the Bureau of Mines will be somewhat lower, but its operations, in general, will continue at about the same level.

The fund for its synthetic-fuels

(Continued on page 132)

Marshall Plan Will End On Schedule, ECA Warns

WASHINGTON. — Reports from Paris last week that the Marshall plan countries do not expect to be on their economic feet by mid-1952 brought a quick warning from top-ranking Economic Cooperation Administration officials that the program "will end on schedule."

Coupled with that warning was a reminder that Congress will pass on the program annually, an implication that if the Marshall plan countries don't show definite signs of achieving their objectives Congress might lose interest and drop the program.

Without extension of the Marshall plan, according to the reports from Paris, the participating countries foresee a trade deficit of $800,000,000 with the rest of the world in the 1952-53 fiscal year, the year after ERP ends. If production and export goals are not attained and imports are maintained on the present proposed schedule, the deficit might run as high as $3,000,000,000, it was said.

The reports did not suggest extending the Marshall plan beyond its scheduled 4 years, although they provided a basis for such a request at any time in the future, and Richard M. Bissell, deputy assistant ECA administrator, said there is no evidence in the reports that the program should be continued after June 30, 1952.

However, Bissell indicated, aid may be extended for a longer term to individual countries, depending on their needs.

The ECA appropriation to be asked of Congress for the coming fiscal year now is estimated at between $4,350,000,000 and $4,500,000,000, and the participating countries will be pressed to increase their industrial exports and find low-cost sources of supply for food and raw materials, the two major problems now confronting them.

Navy Relinquishes 320 Acres in California

WASHINGTON. — Believing that the limit of the oil pools underlying Naval Petroleum Reserve No. 1 in California lie between the lands held under lease by Signal Oil & Gas Co. and Pike Drilling Co. and the former boundary of the reservation, the Navy Department has relinquished 320 acres of land comprising the eastern half of Section 10-30s-22e, which, with other intervening lands, was included in the reserve by Public Land Order No. 460 last April.

An order revoking that part of Public Order No. 460 was issued last week by the Interior Department, paving the way for the two companies to secure renewals of their leases.

ENGINEERING . . .

Continued efficiency of refining facilities depends largely upon engineering knowledge available, not only during the periods of design and construction, but after these facilities have been placed in operation. That is why Universal places so much importance on basic engineering "know-how" . . . why this same "know-how" and long-time experience is made easily available to all refiners regardless of size or extent of operations.

UOP

Aurora Reports on Second Turnaround of Fluid Unit

By Max M. Fisher
Vice-President, Aurora Gasoline Company

FOLLOWING the second shutdown of our 4,000 bbl./day fluid catalytic cracking unit at Detroit, we began the third run at 11 PM, Nov. 3, 1948. This second shutdown required only 79 hours after a total of 324 days on stream. Efficiency of our second run has been calculated at 98.5 percent, and combined with the results of our first run of 176 days, shows an overall efficiency for the unit of 96.1 percent. Tables below give this information in detail.

Max M. Fisher

The fluid unit, designed and engineered by Universal Oil Products Company, was placed on stream for the first time in June of 1947. It combines reactor and regenerator in a single column, a factor that resulted in materially reduced construction costs when compared with those required by the fluid cat cracker of earlier design. We consider this a real saving as the unit has afforded excellent flexibility with improved product return. We are now equipped to handle a wide range of charging stocks without difficulty and are able to keep pace with market demands as they change.

The design of the cat cracker itself, together with the engineering and field service offered by its designers, has proved in a large measure responsible for the efficient operating schedules shown in these tables.

Report of Second Run

Date & Time of Actual Startup ... 6 PM, Dec. 12, 1947

Date & Time on Stream ..... 4:30 PM, Dec. 13, 1947

Date & Time of Shutdown ..... 12:30 AM, Nov. 1, 1948

Days on Stream	324
Total Hours of Run	7,761
Total Hours on Stream	7,711
Total Hours off Stream	50
Total Hours Shutdown	79
Efficiency	98.5%

The 50 hours off stream as noted in this report of the second run were required for the repacking of valves and couplings, the correction of minor electrical difficulties, the connecting in of a new cooling tower and the cleaning of the water side of flue gas steam generator.

Overall Efficiency

The combined results of both the first and second runs have been tabu-

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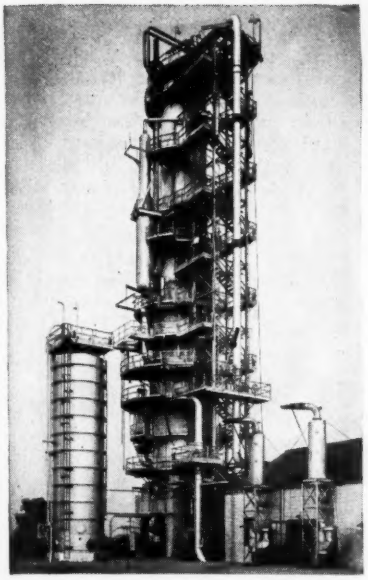


Fluid catalytic cracking unit at Detroit refinery of Aurora Gasoline Company.

lated as follows:

Total Hours, Runs 1 and 2..12,315
Total Hours on Stream 11,858
Total Hours off Stream 126
Total Hours of Shutdown 331
Efficiency 96.1%

Normal operating and maintenance personnel accomplished both turnarounds, and in both, the requirements are considered more than satisfactory. For the first, after 176 days on stream, 4,508 man hours were necessary. The second, after 324 days on stream, called for only 1,677.

Catalyst Losses Below Estimate

For a total raw oil charge of 1,405,384 barrels (average of 4,340 bbls./S.D.) during the second run, total catalyst loss has averaged .207 pounds per barrel. This figure is actually lower than the minimum estimated by the designers of the unit prior to its construction and has contributed considerably to the efficiency of our operation.

UOP Process Booklet

A 24 page booklet describing in detail the processes licensed by Universal Oil Products Co. is now available. Complete flow diagrams accompany the dicussion of each process.

In addition, the book deals with Universal inhibitors, downdraft equiflux and center-wall heaters, and the various services offered to the company's licensee refiners.

The processes discussed include: fluid catalytic cracking, thermal cracking, catalytic polymerization, paraffin alkylation, Unisol mercaptan extraction, thermal reforming, isomerization, catalytic dehydrogenation and catalytic desulfurization.

(Advertisement)

FIELD SERVICE...

In providing adequate field service to licensee refiners, Universal contributes to the successful and economical operation of refineries in all parts of the world. It is a thorough and complete service that covers practically every phase of refinery operation and assures maximum safety, efficiency and economy. It is a service that has helped many refiners keep their operations at a profitable level.

UNIVERSAL OIL PRODUCTS COMPANY

UOP

General Offices: 310 S. MICHIGAN AVE., CHICAGO 4, ILL., U.S.A.
LABORATORIES: RIVERSIDE, ILLINOIS

Universal Service Protects Your Refinery

National Oil Policy and Problems Of Emergency Considered by NPC

WASHINGTON.—The long-awaited report on national oil policy and an almost equally important report on national petroleum emergency are expected to be the outstanding subject of discussion at the first 1949 session of the National Petroleum Council, meeting in Washington January 13.

The policy report, to be submitted by A. Jacobsen, president of Amerada Petroleum Corp., as chairman of a committee which has devoted several months to its preparation, may cut across the current thinking in some federal agencies regarding imports, military reserves, tidelands development, synthetic liquid fuels, and other subjects.

The committee is expected to stress the advantages of competitive effort and incentive, the development of synthetic fuels by private enterprise, continuation of favorable tax laws, encouragement of a concerted industry effort to develop oil on the public lands, the support of independent marketers, for efficient marketing and laws to encourage the development of natural-gas resources by industry.

Foreign Development Stressed

In the foreign field, the report will hold that participation of United States nationals in the development of world petroleum resources is essential to our national security, and that an effective oil policy should encourage access by our nationals to world resources on equal terms with the nationals of other countries, and call for stable agreements between foreign governments and private industry on a basis which will promote development by free competitive methods.

Jacobsen also is expected to demand that the federal Government give diplomatic support with a view to reducing the political risks taken by American companies operating abroad, and that imports shall not be permitted to interfere with domestic exploration and development.

In summary, the report will hold that a vigorous domestic industry is the best assurance of our preparedness for war, that the Government should accumulate only such stocks as would be needed by the military in the early stages of a war and attempt neither to build up inventories that would carry it through a long period nor depend upon underground undeveloped reserves, and that there should be complete consultation between Government and industry on all oil problems.

The report on petroleum emergency, to be submitted by a committee headed by B. Brewster Jennings, Socony-Vacuum Oil Co., also will deal with the question of national defense. The investigation was initiated last summer in response to a request by the Oil and Gas Division that the petroleum experience of the last war be surveyed with a view to making recommendations regarding the measures that would be necessary to safeguard and assure supplies for essential needs in the event of war and the best possible government-industry setup to handle the problem.

A third report dealing with possible emergency problems will be presented by W. W. Vandeveer, president of Allied Oil Co., chairman of a committee on industry manpower, set up at the request of the National Security Resources Board to make a complete survey of the present manpower engaged in the various divisions of the industry, and the requirements of the industry during an emergency. A number of federal agencies are interested in the subject, and the report, perfected at a precouncil meeting of the committee January 11, will discuss also the effect of the present draft procedure on oil labor, and the steps that should be taken to insure adequate manpower in the event of war.

Also to come before the council will be a recommendation to enlarge the scope of authority of the committee on steel requirements headed by Russell B. Brown of the Independent Petroleum Association of America, so that it can continue to follow the steps taken to insure adequate steel supplies and problems of maldistribution. The committee's report was put into final shape at a meeting at council headquarters January 12.

A report by the committee on refining capacity headed by Dr. R. E. Wilson of Standard Oil Co. (Ind.) was completed at a meeting in the council's office January 12.

Budget Is Problem

Other business to come before the council will include the election of a chairman for the current year and a discussion of its budget and possible revision of the present method of raising funds. Currently, all members are asked to contribute a pro rata share of the council's expenses, but some of the smaller oil associations have reported that it is difficult for them to provide the approximately $600 now required and have suggested that a new formula be considered which would lighten the burden where necessary, without disturbing the present representative character of the council membership.

New business to come up will include a request by the Bureau of Mines that the council study the desirability of a complete census of the mining industries, to be taken in 1950 to cover the activities of 1949. While such a canvass by the Census Bureau was approved by Congress in connection with other censuses to be taken this year, no funds were provided. It is estimated that the census, to be taken jointly by Census and Mines, would cost approximately $650,000, and the council agenda committee has passed on the matter and approved the appointment of a committee.

Next Week

Sulfur Compounds—Their Effect on Octane Number of Leaded Fuels. From H. K. Livingston of the du Pont laboratories comes an authoritative reference-type report on this subject.

Corrosion Inhibition With Chromate.—Chief Research Chemist Marc Darrin discusses this subject from standpoint of drilling, oil production, and gas condensate operations.

Automatic Lease Operation.—The Journal's Dallas district editor makes a trip to the East Texas field and describes Atlantic Refining Co.'s new electrical installation on its R. Collins lease, which automatically flows wells—opens and closes separator lines—switches lease tanks.

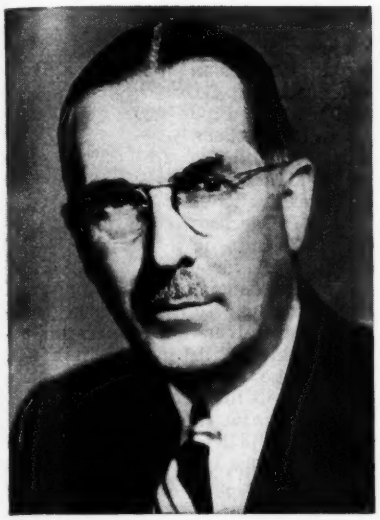
Up in Illinois.—Equipment and operation of Ohio Pipe Line Co.'s Mississippi River terminal at Wood River are detailed by the Journal's pipe line editor.

On the West Coast.—New asphalt plant of Shell Oil Co., Inc., at Portland, Ore. Charging stock is received via tanker from San Francisco—the products are distributed throughout the Northwest.

Down in Venezuela.—New electric drilling barge developed by Creole Petroleum to drill to 15,000-ft. depths.

Gas Turbine Power.—Features of new high-speed prime mover. Design and application factors of these units recently have had considerable study.

PERSONALS



Experience Makes Smith Excellent A.P.I. Official

MORE than 37 years' experience in manufacturing and engineering operations for Standard Oil Co. (N.J.) is the outstanding petroleum-industry background possessed by the newly elected American Petroleum Institute vice president for refining, Chester F. Smith, director and vice president for Jersey Standard. Smith, who was named to the A.P.I. post at the recent annual meeting in Chicago, succeeds Robert E. Wilson, of Standard Oil Co. (Ind.), who had served two terms.

Smith, who worked for the company a full year before entering college, returned each summer for further experience. Following his graduation in 1913 from the University of Pennsylvania he entered the engineering department of Standard's Bayonne refinery. In 1918 he became superintendent of the case and can department, and in 1922 was named assistant to the general superintendent of Bayonne refinery. In 1928 he was named manager of the refinery.

Two years after being transferred to the New York offices in 1931 as assistant general manager of New Jersey refineries Smith was appointed general manager of all company refineries. At the same time he was made a director and vice president of Standard Oil Co. of New Jersey (now Esso Standard Oil Co.). From 1940 until his appointment as a director of the parent company Smith was president of Standard Oil Co. of New Jersey, the principal refining and marketing subsidiary.

Late in 1946 Smith was named vice president of Standard Oil Co. (N.J.). For many years he served as chairman of Jersey Standard's coordination committee, a central study and advisory group for the managements of companies in the Jersey group.

E. G. Collado, foreign exchange manager of Standard Oil Co. (N.J.), has been made an assistant treasurer of the company.

Melvin J. Rupp, Denver, public relations and advertising director, has been appointed district representative of the Fred Eldean Organization, Inc., to direct the public relations program of the Rocky Mountain Oil Industry Information Committee.

Stanwood W. Sparrow, vice president in charge of engineering of Studebaker Corp., has been elected president of the Society of Automotive Engineers for 1949.

John E. Swearingen, formerly in the manufacturing department, has been named executive assistant to **J. R. Rouse,** vice president in charge of operations for Stanolind Oil & Gas Co. Swearingen succeeds **Lewis Finch, Jr.,** who has been transferred to Fort Worth.

Sherman S. Shaffer, Humble Oil & Refining Co., has been succeeded as chairman of the Southeastern Texas section of the American Chemical Society by **Dr. W. O. Milligan,** associate professor of chemistry at Rice Institute. Other new officers include: **T. P. Wier,** Shell Oil Co., secretary, and **Mark C. Hopkins,** Pan American Refining Corp., alternate councilor.

J. W. FOLEY

James W. Foley, assistant manager of the Oklahoma division of the producing department of The Texas Co. in Tulsa, has been appointed assistant to **R. Ogarrio,** vice president in charge of the domestic production department of the company, and has been transferred to New York. Foley, a 1932 petroleum engineering graduate of Texas A. & M., joined The Texas Co. as a rotary rig helper, and in 1933 was made petroleum engineer at Conroe, Tex. From 1937 to 1940 he was petroleum engineer for Bahrein Petroleum Co., Ltd., on Bahrein Island. He returned to the United

Members of general arrangements committee together with chairmen of various other committees planning the annual spring meeting of the Mid-Continent district, division of production of American Petroleum Institute to be held in Tulsa, March 23-25 are: (clockwise) S. G. Sanderson, Gulf Oil Corp., general arrangements; Harold E. Berg, Tide Water Associated Oil Co., secretary-treasurer, Mid-Continent district; Condon MacKay, Carter Oil Co., vice chairman, publicity committee; W. M. Peck, Pure Oil Co., general arrangements committee; Raymond M. Carr, Sinclair Prairie Oil Co., general arrangements; Fred M. Carroll, Shell Oil Co., Inc., chairman of meeting arrangements committee; J. H. Field, Sohio Petroleum Co., chairman of program committee; Lloyd E. Elkins, Stanolind Oil & Gas Co., chairman of Mid-Continent district and acting chairman of general arrangements committee; Eugene Hosford, Gulf Oil Corp., chairman hotel committee; J. A. Bermingham, Jr., The Texas Co., chairman of registration committee; H. M. Cooley, Bethlehem Steel Co., chairman, publicity committee; A. F. Keating, Keating Drilling Co., general arrangements; M. J. Heald, The Texas Co., general arrangements; M. C. Hoffman, Stanolind Oil & Gas Co., general arrangements; and Glenn F. Bish, Ohio Oil Co., general arrangements. Not in the picture were W. A. Alexander, Shell Oil Co., Inc., chairman of general arrangements committee; J. S. Freeman, Skelly Oil Co., general arrangements; J. K. Ellis, Sunray Oil Co. general arrangements; and Whitney M. Elias, Stanolind Oil & Gas Co., chairman, entertainment committee

PERSONALS

States in 1940 and in 1944 was made superintendent of gas and gasoline operations with headquarters in New Orleans. Foley went to Tulsa January 1, 1948.

J. M. Lilligren will become district geologist at Sinclair Wyoming Oil Co.'s new office in Billings, Mont.

Ernest R. Lilley, for several years manager of the oil and gas division, Great Lakes Carbon Corp., has been elected vice president of the company, in charge of same division. He will continue as its chief geologist and will make his headquarters in the company's New York office.

A. C. Atwater, petroleum and chemical engineer, has joined Thomas Bryan & Associates as manager of its petroleum and chemical division. Atwater has recently returned from an assignment with Arthur G. McKee & Co. as project manager for construction of a refinery in Rotterdam, Holland, for the California Texas Oil Co., Ltd.

B. T. W. van Hasselt has been named to the board of Ural Caspian Oil Corp., Ltd., London, England.

George F. Mitchell, president, Peoples Gas Light & Coke Co., Chicago, has been appointed chairman of the 1949 convention committee of the American Gas Association to be held in Chicago, October 17-20, 1949. **F. X. Mettenet,** vice president, Peoples Gas, will serve as vice chairman of the committee on over-all arrangements of the convention.

Dr. J. L. Franklin, Humble Oil & Refining Co., is the newly elected chairman of the South Texas section of the American Institute of Chemical Engineers. Other officers include: **Dr. W. A. Cunningham,** department of chemical engineering, University of Texas, chairman-elect; **L. S. Daniels,** Gulf Publishing Co., secretary-treasurer.

Lynn R. Strawn, formerly with The Texas Co. at Port Arthur, Tex., has been appointed manager of the Neches plant of Jefferson Chemical Co., Inc. Strawn replaces **A. A. Triska,** who was transferred to New York as assistant to the manager of the production department.

T. S. GREEN

T. S. (Ted) Green has been named chief geophysicist for Sunray Oil Corp. to carry forward the company's expanded exploration program. **John M. Schoeppel** has been made assistant to **Louis Roark,** superintendent of the land department. Green, an engineering-physics graduate of University of Oklahoma, was associated with Seismograph Service Corp., Engineering Laboratories, Inc., and for the past 3 years has been with Republic Exploration Co. handling geophysical work in Southwest Texas for Sunray. Schoeppel for the last four years has been head of the land department of Stephens Petroleum Co.

William D. Waltman, director and vice president of Franco Wyoming Oil Co. and president of several of the company's subsidiaries, McElroy Ranch Co., Franco Western Oil Co., Franco Central Oil Co., and Franco Securities Corp., retired from active participation in the affairs of the company effective January 1.

Robert E. Kepke, vice president of British - American Oil Producing Co. and Toronto Pipe Line Co., has been transferred to Toronto, Canada, as vice president of British American Oil Co., Ltd., in charge of the newly created department of supply and transportation. Kepke is a law graduate of the University of Texas and before going to British-American in 1941, was in the attorney general's office in Texas. In his new position he will have charge of the purchasing of all crude oil and its transportation from sources of supply.

E. N. Dunlap, California Research Corp., has been elected chairman of the Delta (New Orleans) section of the American Institute of Mining and Metallurgical Engineers. Other officers are: **C. R. Blomberg,** The California Co., vice chairman; **H. M. Krause,** Humble Oil & Refining Co., vice chairman; **Fred E. Simmons, Jr.,** Louisiana Land & Exploration Co., secretary; and **E. G. Robinson,** Shell Oil Co., Inc., **A. P. Claudet,** Schlumberger Corp., **J. C. Posgate,** Humble, **B. C. Craft,** Louisiana State University, and **H. C. Petersen,** Freeport Sulphur Co., all directors.

Craig F. Cullinan, president of American Republics Corp., Houston, has been elected a director of the National Industrial Conference Board for 1949. The board is an independent and nonprofit organization performing research in economics and business.

J. A. de Lancy (center, standing), vice president and director, Asiatic Petroleum Corp., who is retiring after more than 30 years service with Royal Dutch-Shell group, was guest of honor at a luncheon of the New York Chapter of Nomads. Other guests at the luncheon, all associates of de Lancy in Asiatic Petroleum, are: (standing) J. C. Poulton, R. W. Parkinson, S. J. Veenstra, W. P. O'Malley, de Lancy, T. G. Schad, W. J. Byrne, H. Hotchkiss, and A. Nilsson. (Seated) C. F. Lunghard, J. Schneider, C. E. Staines, B. J. Joyce, L. J. van Dijk, J. Marciano, J. Thielen, and E. F. Carney

Charles A. Canfield, division geologist, Texas-Louisiana Gulf Coast division of Stanolind Oil & Gas Co., is transferring to central division headquarters at Oklahoma City where he will be senior geologist on special regional geological assignment. **Russell A. Weingartner** will succeed Canfield as division geologist, transferring to Houston from Tulsa. **M. M. Montgomery,** assistant operating superintendent in producing department in Tulsa, will go to Corpus Christi, Tex., as district production superintendnet.

O. F. Sebesta, The Texas Co., has been made assistant superintendent, production department, West Texas-New Mexico district with headquarters in Midland.

C. E. "Pete" Perkins, Cities Service Gas Co., for many years pipe-line foreman at Columbus, Kans., has been transferred to a new assignment as pipe-line foreman at the newly created Hutchinson, Kans., district.

Harvey Cash, The Texas Co., supervisor of field operations, geophysical division at Houston, has been promoted to be assistant to the division manager of the Oklahoma division, with offices in Tulsa. **V. C. Scott,** division geologist, Oklahoma division, has been advanced to assistant division manager and **L. H. Lukert,** senior geologist, succeeds Scott as division geologist.

A. K. Tyson has been elected vice president of American Republic Corp. and will devote his full attentions to exploration and production.

Perry S. McClure, formerly district geologist at Denver, Colo., has been named district geologist at Baton Rouge of the newly created district exploration office of Shell Oil Co., Inc. McClure will be in charge of exploration activities of the company for southeastern Louisiana. **Jack D. Hunnicutt,** former district land agent for Shell at Tallahassee, Fla., has been made district land agent at the new district land office at Lake Charles, La.

J. T. Deane has been elected vice president of Oronite Chemical Co. Dean came to Oronite from Standard Oil Co. of California where he was vice president and manager of manufacturing and lubricating oil additives.

Niles B. Winter, Atlantic Refining Co., has been appointed division manager of the new West Texas-New Mexico division office in Midland, Texas. The division will direct all leasing, exploration, drilling, and producing activities in the area for Atlantic Refining. **W. M. Ford** will be in charge of land and leasing activities, **T. C. Frick** of drilling and producing operations, and **R. T. Cox** of geological and geophysical exploration.

James A. McNeese, Jr., attorney, has joined Continental Oil Co. at Ponca City as contact man in the natural gasoline and gas division.

Harry F. Miller, geologist-engineer with Geolograph Co., Inc., has been transferred from Oklahoma City to Casper, Wyo., as manager of the new division office which serves the Rocky Mountain region.

H. E. Harrington, Malco Refineries, Inc., Rosewell, N. M., has been elected president for 1949, of New Mexico Oil Scouts Association, succeeding **R. L. Walker,** Continental Oil Co., Midland, Tex.

SHIFTS—

C. C. Addison, geologist, Pure Oil Co., New Orleans to Houston; **C. L. Glover,** superintendent, Pure Oil Co., West Liberty to Cisne, Ill.; **D. A. Green,** geologist, Pure Oil Co., Olney, Ill., to Newark, Ohio; **W. M. Parsons,** superintendent, Pure Oil Co., Jal, N. M., to Casper, Wyo.; **M. H. Plumber,** engineer, Pure Oil Co., Houston, to Olney, Ill.; **P. G. Williams,** superintendent, Pure Oil Co., Bell City to Cameron, La.

R. L. Talley, engineer, Union Oil Co. of California, Santa Maria to Orcutt, Calif.; **H. F. Greenfield,** geologist, Continental Oil Co., Gonzales to Aspermont, Tex.; **T. E. Keffer,** superintendent, Stanolind Oil & Gas Co., Alvin to Bishop, Tex.; **R. L. Messman,** geologist, Continental Oil Co., Big Lake, Tex., to Wichita, Kans.; **Harry H. Halsell,** engineer, Devonian Oil Co., Goldsmith to Odessa, Tex.

D. P. South, Jr., geologist, Transgulf Corp., Houston to Shreveport; **J. J. Cowden,** geologist, Continental Oil Co., Iowa Park to Luling, Tex.; **W. J. Wrancsky,** engineer, Magnolia Petroleum Co., Premont to Mirando City, Tex.; **Laurence N. Dexter,** geologist, The Atlantic Refining Co., Three Rivers, Tex., to Lake Charles, La.; **J. G. Klein,** geologist, Continental Oil Co., Wichita Falls to Stephenville, Tex.

H. Van Streain, engineer, Tri-Petroleum Corp., Harden, Mont., to Van Nuys, Calif.; **Gerald P. Salisbury,** geologist, Union Oil Co. of California, Cut Bank, Mont., to Laramie, Wyo.; **Robert J. Gutru,** geologist, Cities Service Oil Co., Newman Grove, Neb., to Burbank, Calif.; **Robert I. Levorsen,** geologist, The California Co., Marietta to Waurika, Okla.

Harry V. Bell, superintendent, McKinney Drilling Co., Oklahoma City to Mt. Pleasant, Tex.; **Floyd D. Aaring,** engineer, Gulf Oil Corp., Seminole, Okla., to Chase, Kans.; **Bob Leibrock,** engineer, Stanolind Oil & Gas Co., Tulsa, to Lubbock, Tex.

DEATHS

James D. Stirling, who retired in 1943 from Socony-Vacuum Oil Co., Inc., for which he was traffic manager, died January 5 at his home in Sea Girt, N. J.

Willard T. Bauer, 60, manager of the rate and valuation department of Petroleum Advisers, Inc., a subsidiary of Cities Service Co., died January 4 at his home in South Orange, N. J.

Alford Harmon Golden, 56, superintendent of North South Oil Co. and drilling contractor, died December 11 in Goldsboro, Tex.

Robert F. Higgins, 57, attorney in legal department of Humble Oil & Refining Co., died January 3 at his home in Houston.

John G. Craig, 61, foreman, Houston refinery, Sinclair Oil Co., died January 3 at Galena Park, Tex.

William J. Cain, 80, retired independent oil producer, died January 3 in Kansas City, Mo.

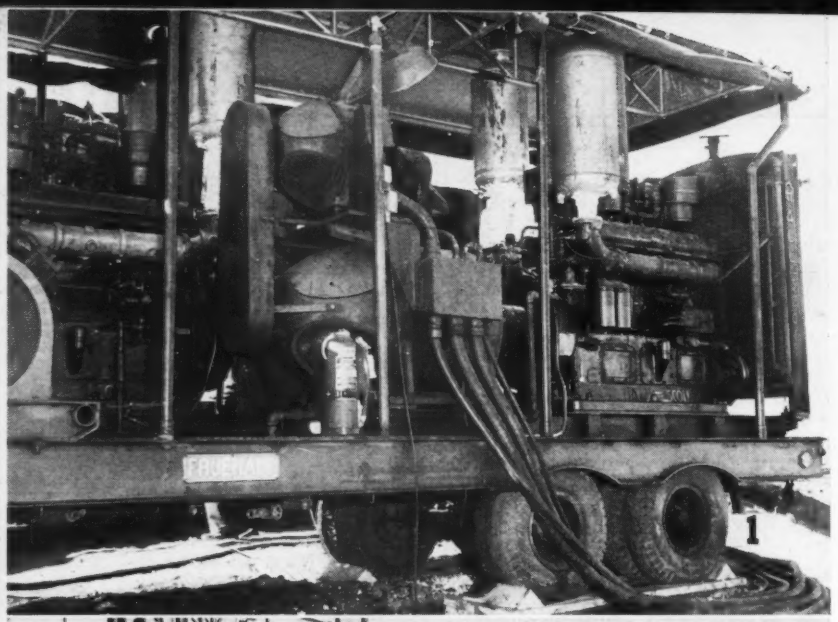
Marion J. Lytle, 82, pioneer oil producer of Tulsa, died January 9 in Tulsa. Lytle was formerly associated as an independent producer with Clyde G. Gray.

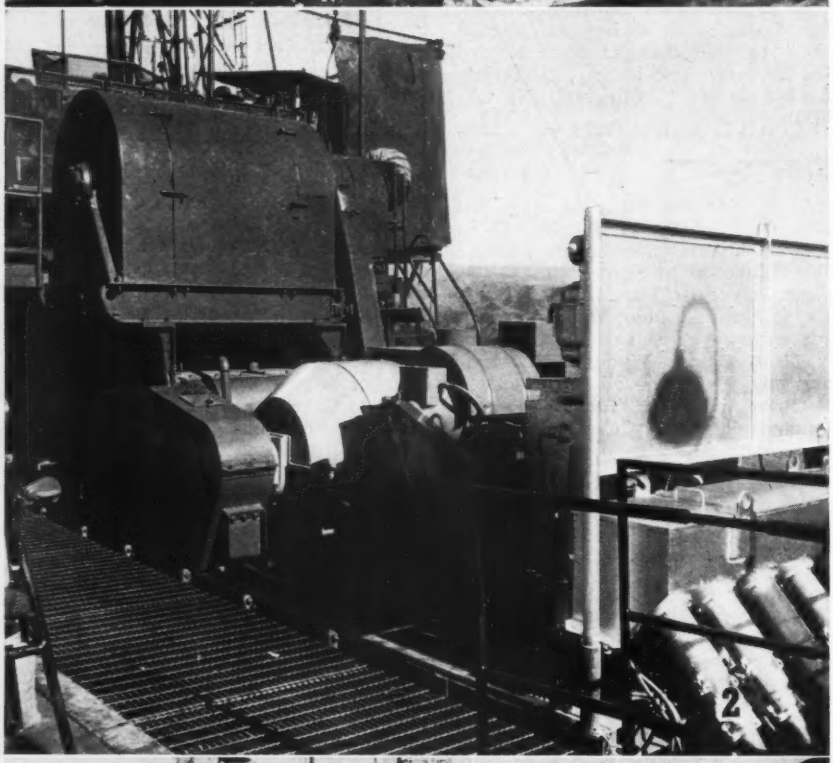
Fred M. Welsh, 48, early-day oil man, formerly with Texas Pipe Line Co., died January 9 at Strang, Okla.

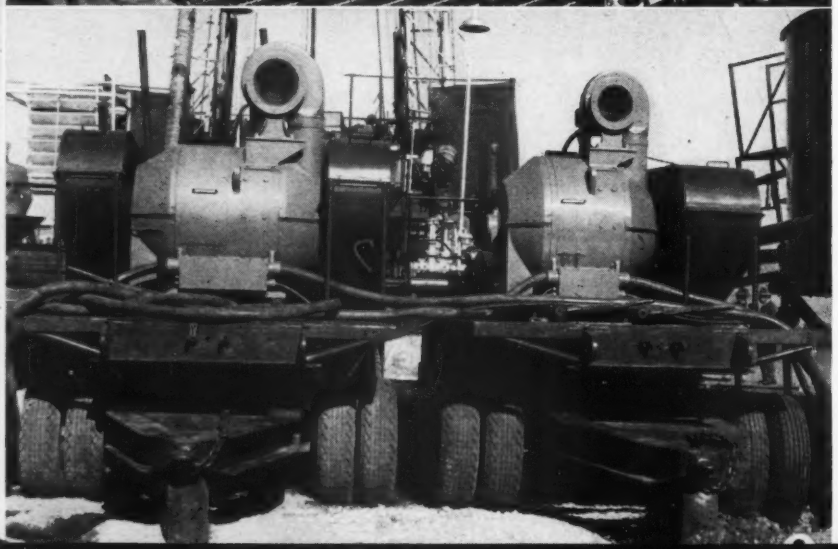
William E. Hall, 54, an assistant traffic manager, The Texas Co., died January 1 at Mount Vernon, N. Y.

R. E. Beard, 57, manager Sugar Creek, Wyo., refinery, Standard Oil Co. (Ind.), died December 22.

Dave Huffman, pipe-line foreman in Kansas City district, Cities Service Gas Co., died December 26 at Gardner, Kans.







Electrical

Portable Rig

CONSIDERABLE interest has been shown in the portable electric rotary drilling rig recently placed in service by Shell Oil Co., Inc., at Ventura Avenue field, Ventura, Calif. Electrical features of this rig have greatly revived interest in advantages inherent in the use of electric power for drilling oil wells.

The flexibility and convenience of the new Shell rig arise from the use of an interconnection scheme which makes possible multiple combinations of generators and motors and the concentration of control of all normal drilling and hoisting operations at the driller's station. The flexibility is illustrated by the accompanying diagram which shows a simplified schematic diagram of the main circuit connections at the generators and motors. Some of the possible combinations will be described.

Three Generators Used

Three main power buses are provided. Any one of the three generators is connected to each bus. During a normal drilling operation, the table is powered by one generator and the larger mud pump by the two remaining generators. Either of the

*Consulting and application engineer, Westinghouse Electric Corp., Los Angeles.

1—This is one of the power unit trailers for Shell Oil's electric rig; it carries two engine-generator units

2—Closeup of the 500-hp. draw-works motor. Note carefully designed guards and compact arrangement of enclosed electrical auxiliaries

3—View of the two trailer-mounted mud-pump motors. Cables are of flexible wire insulated with synthetic rubber and are easy to connect up at new drilling locations

Features of Shell Oil's

by E. H. Hulse*

two mud pumps may be used as the main pump for circulating mud in the hole. The main mud pump may be powered with only one generator and the second pump by the remaining generator, or the main pump may be powered by two generators, the mixing pump by the third generator, with table operation excluded. The two pumps may be paralleled taking power from two generators, with the table taking power from the third generator.

Provisions are made for various drilling-up operations involving the draw works. It is possible to hoist, rotate, and pump with independent speed control for each function, and one generator assigned to each operation. If necessary, the hoist may be powered by two generators with the third on either the table or either pump. Also a pump may be powered by two generators with the third on the hoist.

Any one of the three generators may be connected to any one of the three buses, making any single generator remaining in service in an emergency available to any function. The provision of three power buses affords independent speed control of three operations when each is powered by a single generator. Setups for the various combinations are made by means of selector switches on the dead front portion of the main control cabinets.

Central-Station Control

The driller has convenient and complete control of all operations from his central station. Such convenient concentration of control is afforded by the three levers for operation, the three oil-immersed master controllers, the explosionproof pushbutton station with emergency stop, drill hoist and normal drill up, pushbuttons, and the foot-operated spin-out switch. The three master controllers provide complete speed control of the draw-works and table motors in the forward and reverse directions of rotation and complete speed control of the pump motors in the forward direction only. The emergency stop pushbutton provides for stopping all main power operations immediately in an emergency.

The drill-hoist pushbutton provides for changing between drilling and hoisting operations for normal setups. Should the driller decide to come out of the hole, or for some other reason desire to hoist with full power, he may change from drilling operations to hoisting, with all generators supplying power to the draw-works motor, by simply depressing the hoist button. This automatically disconnects all generators from pump and table motors and connects them to the draw-works motor.

The driller may spin out a joint after it has been cracked by simply depressing the pedal of the spin-out switch. While this switch is depressed, power is automatically made available to the table motor for spinning out the joint. Speed for spinning out may be controlled in a normal way or in accordance with a pre-set position of the number three master controller.

By placing the normal drill-up pushbutton in the drill-up position, one of the two generators powering the main pump is automatically transferred to the draw works so the bit may be raised while being rotated and mud circulation continues.

The driller has a picture of motor loading at all times by means of the electrical meters provided at his station. An additional meter indicates the speed of the rotary table in r.p.m. The driller also has control of each engine governor setting so that the engines may be operated at reduced speed when desirable.

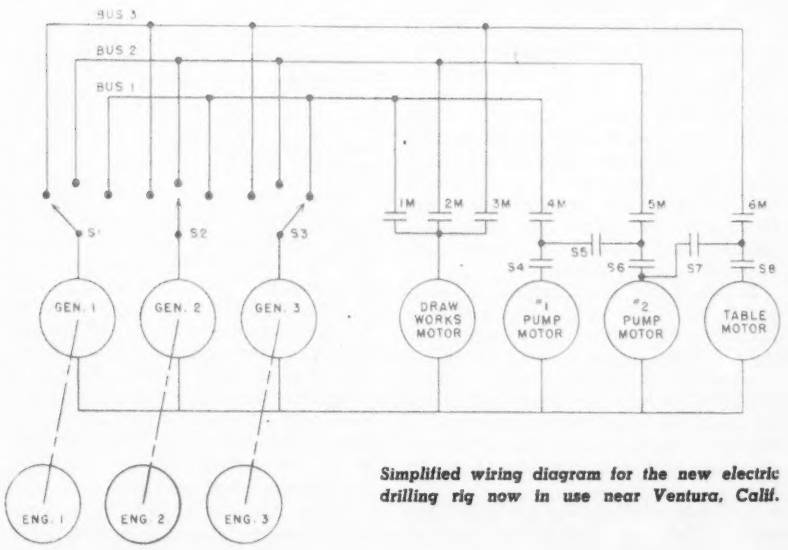
Safety of operation and personnel is given special attention. Derrick-floor equipment, master controllers, pushbutton station, and foot switch are oil immersed or explosionproof. A portion of the main control panel is of "dead front" construction. On it are mounted those instruments and devices which an attendant must occasionally observe or operate in the normal functioning of the equipment. This he may do with no personal danger. The doors to the live sections of the cabinet, which house contactors, relays, resistors, wiring, terminals and other "live" apparatus, are interlocked so that when opened all high voltage is immediately eliminated from the rig.

Control of the motor speed is accomplished by varying the voltage on the motor armature. The main field of each generator is supplied from a small auxiliary exciter, mounted on top of the main generator. Each exciter has its field connected to a small rheostat which is located in a master controller near the driller's console, and operated from the console by a pneumatic control device. Movement of the console operating lever causes a corresponding movement of the rheostat which varies the output voltage of the generator and thus the speed of the motor. If the lever is moved in one direction from its center position, the motors will operate in the forward direction, and if moved in the other direction, the motors will operate with rotation reversed. The controls are simple and easy to operate and are all grouped together as a part of the driller's console.

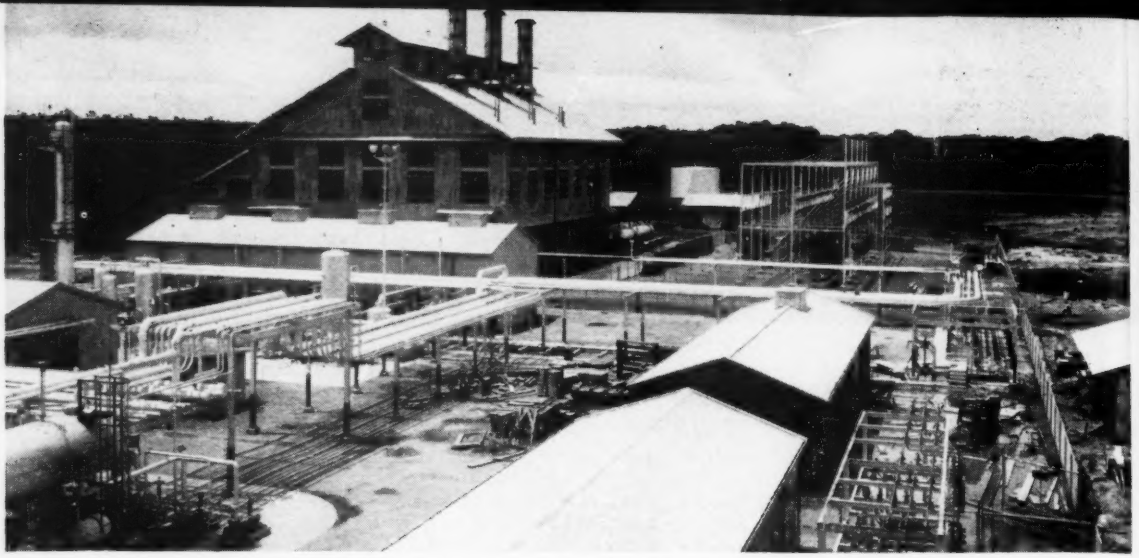
Engines Are Stallproof

Engines cannot be stalled. The inherent characteristics of the generators are such that the engine is not

(Continued on page 93)



Simplified wiring diagram for the new electric drilling rig now in use near Ventura, Calif.



View of part of the huge new "triple purpose" plant in the center of Jusepin field, eastern Venezuela. Owned by Creole Petroleum Corp., the operations performed are (1) crude-oil stabilization, (2) pressure maintenance, (3) crude-oil desalting and dehydration. Large building in rear is the new electrical power plant. It now contains two 5,000-kva. generators; a third unit is planned for the future

Creole's New Combination Plant at Jusepin Performs Triple Function

by K. B. Barnes and D. H. Stormont

IN Jusepin field, State of Monagas, Eastern Venezuela, Creole Petroleum Corp. recently has placed in operation an outstanding oil-field plant installation. The new plant embodies the latest in petroleum engineering and process design and equipment. As an oil-field operation it is unique because nowhere else so far are all three of the objectives of the new plant performed together in one centralized setup.

The new Creole plant performs three principal functions. These are:

1. Pressure maintenance.—Two compressors make available some 10,000,000 cu. ft. per day of 1,700-psi. natural gas for reinjection in the pilot gas-injection project. Over 2 billion cubic feet already have been returned to three injection wells in the gas-cap area of the J-6 oil sand. Studies are being made to determine the feasibility of increasing pressure-maintenance facilities to handle some 30,000,000 cu. ft. per day.

2. Crude-oil stabilization. — About 44,000 bbl. daily of Jusepin crude is stabilized for removal of propane and lighter hydrocarbons. When blended with stabilizer bottoms, the finished crude has a vapor pressure of about 6.5 psi. Gravity of the crude is raised about 1° A.P.I. and a gain in volume of about 1,000 bbl. per day of stock-tank oil is obtained.

3. Crude-oil desalting and dehydration.—This unit, a Standard Oil Co. (N. J.) design with Tretolite addition, reduces the salt content of Jusepin crude from about 150 lb. per 1,000 bbl. to an average of about 20 lb. per 1,000 bbl., and b.s. and w. content from about 2.0 to less than 1 per cent.

In the Journal issue of December 2, 1948, two members of the Journal's engineering editorial staff described the new pressure-maintenance plant of Mene Grande Oil Co. in Eastern Venezuela. In this article the same authors tell about another new pressure-maintenance operation in the same area. The authors visited both the Mene Grande and Creole plants while they were under construction and then later after placement in initial operation.

All the stated purposes of this new Creole plant—pressure maintenance, crude stabilization, crude-oil desalting, and dehydration—were found to be necessary and desirable objectives at Jusepin. So it was good planning by Creole engineers to interrelate and consolidate these features into the one unified plant. It is obvious that such a combined installation could be more efficiently operated and maintained than could separate plants for performing a single function.

A power plant consisting of two 5,000-kw. units also has been constructed adjacent to the combination plant and generates electricity for Creole's Jusepin-Mulata-Quiriquire-Caripito power system. It also provides the steam necessary for the combination plant's operation and receives its fuel supply from the main wet-gas gathering system and plant residue gas.

Jusepin Field Features

A general picture of the oil field itself must be given to present properly the objectives and purposes of the new plant. Jusepin field, discovered in 1938, extends over an area of about 15,000 acres, and has produced somewhat more than 118,000,000 bbl. of crude oil. There are a total of 416 oil wells, of which 175 were completed as dual producers.

Today's current production of about 44,000 bbl. is being largely produced by 315 flowing wells. The "pressure maintenance" part of the project, incidentally, is designed to prolong the flowing life of these wells besides conserving the produced gas by reinjection, and increasing the ultimate recovery of oil.

The two geological oil-producing formations in Jusepin field are the La Pica (Miocene) and the Carapita (Oligocene), the average well completion depth being 5,200 ft. The productive section of the La Pica formation is divided into 23 overlapping sands, all of them thin, but the majority large in areal extent. These

Another part of the new Creole plant at Jusepin. Building in left foreground contains three 800-hp. 2-stage gas-engine-driven compressor units. The natural gas remaining after gasoline extraction is boosted to 2,200 psi. for return back to the producing formation

sands are separated by shale sections and are therefore noncommunicative among themselves, except through the well bores. The sands have been classified into four zones, namely, the Sigmoilina, and the upper, middle, and lower Textularia. It is into one of the upper Textularia sands (called J-6) that gas is being returned. Injection into the J-20 and J-21 sands of the lower Textularia currently is being planned.

The general structural picture is a combination of structural and stratigraphic traps, in which complications are present, such as anticlines, synclinal troughs, monoclines and faults. The productive section pinches out to the north and northwest, and shales out to the south and southeast. Stationary water tables are found in a syncline located in the eastern portion of the field. The western boundary is provided by Muri field (Sinclair) and Mulata field (Creole-Pantepec joint property).

One of the features of Jusepin field is the existence of numerous faults which divide each zone into many separate blocks. The circumstance that most faults have small displacements and large dips has made it difficult to locate them, and as a result of this, the delineation of some blocks is still unknown or doubtful. This incomplete knowledge of structural conditions will have to be worked out experimentally from the performance of the gas-injection operations.

There are 14 flow stations or manifolds wherein are led the flow lines from the individual wells. One flow station is located next to the plant site and the other 13 are spread out throughout the field at strategic points. The oil-gas separation of the crude at all flow stations throughout the field is delivered to the central plant at a terminal pressure of slightly over 100 psi.

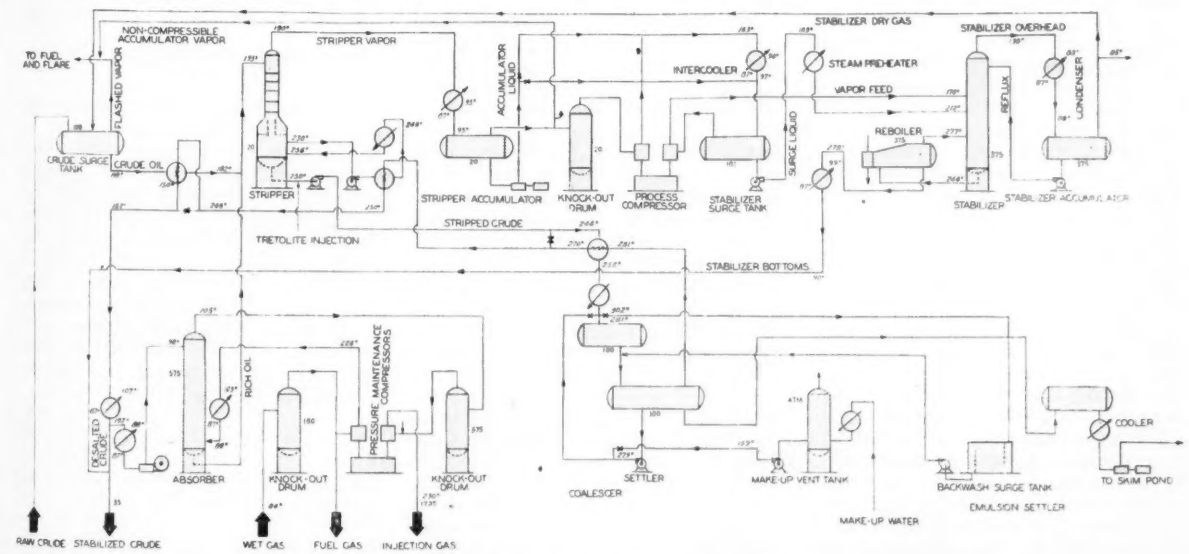
Program for Gas Injection

The J-6 sand was chosen as the pilot pressure-maintenance project because it is most productive of the upper Textularia sands, and is bounded by structural and stratigraphic traps in such manner as to make it suitable for secondary-recovery operations. Also, existing wells in the gas-cap area were available for use as input wells so that no drilling was necessary.

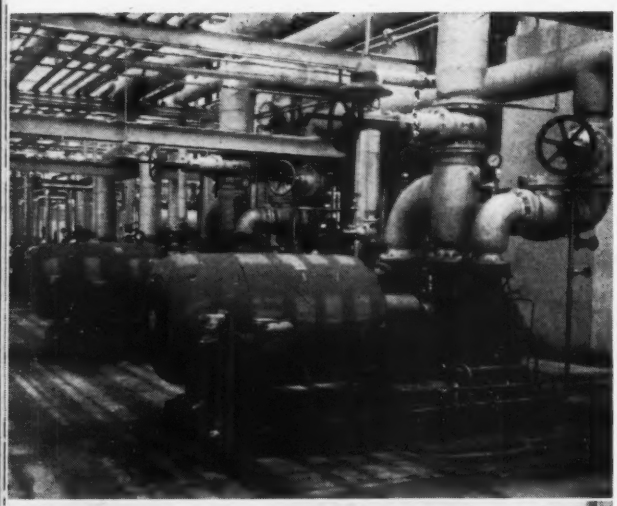
Permeability of the section is found to be extremely variable, ranging from 5 to 535 md. throughout the vertical section. Other properties of the J-6 sand are: porosity, 31 per cent; connate water, 36 per cent of pore space; average sand thickness, 34.5 ft.; and average depth, 3,000 ft. subsea.

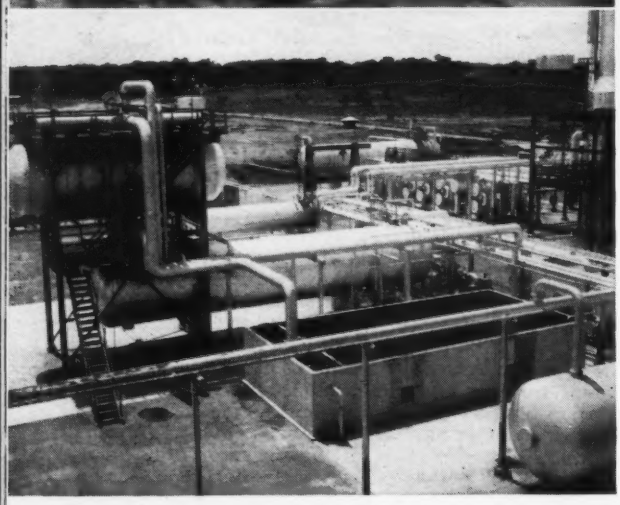
The areal extent of the operation was delineated arbitrarily for this pilot study—the J-47 fault forms a natural barrier on the north, and closure for the gas cap on the south. It is believed that the operation will not affect oil production beyond the fourth line of offsetting wells.

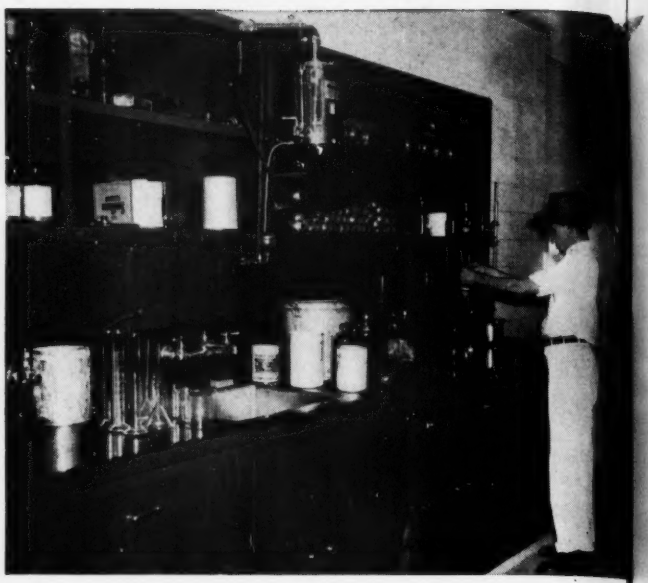
Gas-injection operations were started on August 27, 1947, some 5,000,000 cu. ft. of gas being returned to two wells. On November 26, gas also was started into a third well. In Febru-



Process flow diagram of the Jusepin plant







Upper left: Long row of circulating and process pumps in the natural-gasoline-manufacturing section. Left: View of the equipment for crude-oil desalting and dehydration. This is done by the newly developed "Jersey" process. In center of photo can be seen horizontal coalescer cylinders. Upper right: Creole plant operator runs tests in one of the laboratory rooms in the new plant

ary of this year, gas injection was then stepped up to 10,000,000 cu. ft. Plans call for the volume of gas returned to be increased to 30,000,000 cu. ft. daily; also for the beginning of pilot operations in the J-20 sand and J-21 sands. The three wells being used in current injection operations are all in the gas-cap area.

In order that any channeling of gas may be easily detected, Creole has just completed the installation of a carbon-monoxide gas generator at the plant site. This equipment consists of a 3,000-cu.-ft.-per-hour generator and two motor-driven compressors, one of which will act as a standby. These units are four-stage, 3,000-psi. compressors driven by 50-hp., 1,755-r.p.m. motors.

Crude from the field flow stations upon entering the plant is flashed into a large surge drum at 100 psi. Gas removed in this flashing process is run to the plant fuel system. Crude oil from the surge tank passes through four primary heat exchangers where it is heated to 170° F., and then pumped to the top of the 11-tray stripper where it is steam-stripped at 20 psi. and 235° F. The stripped or stabilized crude is taken from the base of the tower, while sufficient crude to maintain a top tower temperature of 190° F., is taken from the base of the reboiler section, passed through the secondary heat exchangers, and returned to the tower.

After being heated to 300° F. in a preheater, the stripped crude is then run to the desalting unit. The desalting unit was designed for mechanical desalting by the Jersey process; however, it has been necessary to add a small amount of chemical in the crude desalter charge in order to effect satisfactory results. Just before entering the horizontal coalescer cylinder, 5 per cent fresh water and 50 per cent brine recycle are added to the oil stream. The water is added to act as an emulsifying agent when the mixture is passed through the emulsifying valves (where a drop of 5-10 psi. takes place) into the coalescer. A bed of 24 in. of gravel topped by 18 in. of sand is contained in the coalescer. Upon passing through these beds, the emulsion is broken, as the small droplets contact with one another and unite to form drops of sufficient size that the oil and water separate.

Dropping down to the settler immediately below, where separation of the oil and water phases takes place, the water is removed from the bottom. The desalted crude passes off the top of the 11-by-60-ft. horizontal vessel. Brine from the bottom of the settler is recirculated at a rate up to 50 per cent by volume of the crude charge. Brine surplus is withdrawn to the skim pond.

The desalted crude is passed through heat exchangers countercurrent to the incoming crude, blended with the stabilizer bottoms, and then pumped to storage. At a point between the final cooler and where the stabilizer bottoms are injected into the crude stream, however, some 65 g.p.m. are taken from the crude stream and pumped to absorption tower for use as a lean-oil medium.

The blended crude oil has a Reid vapor pressure of about 6.5 psi. The salt content is around 20 lb. per 1,000 bbl. as compared with an initial content of around 150 lb. per 1,000 bbl.

Performance of Crude Stabilization Unit

An idea of the performance of the crude-oil stabilizer unit may be gained from the following data. These pertain particularly to design rates and feed composition. Although for any given time the actual operation data may be different, the fractionating equipment has been found to perform in accordance with design specification. The crude oil coming in from the field has a gravity of 38° A.P.I. Its composition, as saturated with gas at 250 psi. and 100° F., is approximately:

	Mol %	B/D
CH_4	6.25	662
C_2	3.64	547
C_3	6.29	1,082
Isobutane	3.16	646
n-Butane	4.07	804
Pentanes	5.89	1,344
Hexanes plus	70.70	33,915
Total	100.00	44,000

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The composition of the products from the stabilizer, to cite two cases under "design" conditions, may run as follows:

	Case 1 41,650 B/D of 33.3° at 110° F.		Case 2 41,800 B/D of 33.5° at 110° F.	
	Mol %	B/D	Mol %	B/D
C_3	0.4	64	1.4	193
Iso-4	3.4	583	3.4	597
N-4	4.7	776	4.7	783
Pentanes	6.9	1,324	6.9	1,324
Hexanes plus	84.6	38,903	83.6	38,903
Total	100.0	41,650	100.0	41,800

Gas Compression and Stripping

It was mentioned previously that the location of one flow station is next to the central plant, and that gas from the high-pressure separator, approximately 180 psi., there totals about 20,000,000 cu. ft. per day. Currently about 10,600,000 cu. ft. of this is being compressed to 1,600 psi., in two stages for the pressure-maintenance operation, and the remainder is transported to the fuel-gas header.

The incoming wet gas is first passed through a scrubber and then to the first stage intake manifold of the two 800-hp. compressors used in the gas-injection operation. Here it is boosted to absorber pressure and, after passing through the interstage cooler, enters the base of the 36-in., 22-tray absorber and ascends countercurrent to the crude-oil cut used as an absorption oil.

Dry gas from the top of the absorber, which is operated at 600 psi. and 100° F., passes through a scrubber and is compressed to injection pressure, approximately 1,700 psi., in the high-stage cylinders. This high-pressure gas is used for injection into the three input wells now being utilized in pressure maintenance project.

Rich oil from the base of the absorber is pumped to the crude-oil stripper where it joins the incoming crude stream. Overhead vapors from the stripper are fed to the low-stage of the recompressor where they are boosted from 20 lb. to 100 lb. After passing through an interstage cooler and knockout drum the gas is raised to 400 psi. in the high side of the recompressor. It is then taken to the 66-in.-diameter, 30-tray stabilizer, entering either on the nineteenth or twenty-third tray.

Liquids dropped out in the first-stage accumulator, which also serves as the stabilizer feed surge tank, are joined by those removed in the stripper overhead condensate accumulator and the combined streams fed into the stabilizer on either the eleventh or fifteenth tray. Normal temperatures maintained on the stabilizer are 250° F. at the base and 126° F. at the top; the normal pressure is 375 psi.

Vapors from the top of the stabilizer, largely propane and lighter hydrocarbons, are taken to the electrical plant where they are burned for boiler fuel. The stabilizer bottoms, essentially a propane-free product, are cooled and blended into the desalted crude downstream from the absorber lean-oil takeoff point.

Equipment in the Plant

The Jusepin plant contains the most modern equipment for gas handling and processing operations, and included among the major items are the following:

Cooling tower.—This is a three-cell tower of the induced-draft type. Each cell contains a four-blade fan unit driven by 40-hp. electric motor through a worm-type reduction gear. The tower itself is 85½ ft. long, 29½ ft. wide, 35 ft. high. The tower will cool 10,000,000 g.p.m. of water from 112° F. down to 93° F. when the wet bulb temperature is 85° F.

Compressors.—In the compressor building itself are located three 800-hp., four-cycle, two-stage gas-engine-driven units, two of which are in pressure-maintenance service and one in recompressor process service. The process compressor is equipped with cylinders to handle 7 million cubic feet of 20-psi. gas from the stripper overhead accumulator, boosting this gas in the first stage to 130 psi. This gas is passed through intercoolers to the stabilizer feed surge drum and those vapors which are not condensed are fed to the second stage of the compressor where they are further compressed to stabilizer pressure, 375 psi. The pressure-maintenance compressors can handle 10,000,000 cu. ft. of gas from 200 to 2,200 psi.

In addition, there are two 10-hp., two-stage air compressors to provide compressed air for starting the main compressors. There is also another similar unit to provide compressed air for the control instrumentation. These units are electrically driven.

Instrumentation.—The plant contains a large number of controllers actuating process equipment according to the temperature, pressure and required flow conditions. The control instruments themselves are flush-mounted in the central gage board panel. High-level alarms are installed on the suction and interstage knockout drums in the gas compression system, and these controls are electrically operated and are explosion-proof. In the installation, each knockout drum is fitted with two alarms, one above the other. The lower alarm when tripped lights a red lamp on the board and sounds a horn. On the other hand, when the upper alarm is tripped, its circuit grounds the ignition system of the compressors and shuts them down.

Safety valves provided on the processing towers and vessels are designed in size to relieve the full load contained at maximum safe working pressure. The vapor release systems are piped to discharge through extended vent stacks to the atmosphere. In case of the liquid relief systems, the discharge is through a header to blowdown tanks.

Reciprocating pumps in the plant are protected by safety valves with the discharge piping leading back to the pump suction. The gas compressors are protected by safety valves piped to discharge to atmosphere extending through a vertical stack above the roof of the compressor house.

Repressure lines.—Within the plant site, the high-pressure gas lines to the field injection system are laid above grade on concrete sleepers. The discharge header is made of 6-in. pipe and is anchored every 6 ft., and the 3-in. repressure lines are anchored every 12 ft. Two orifice plates are fitted in the header to assist in dampening any vibrations which may be set at certain loads.

The outgoing repressure lines carrying the hot high-pressure gas are insulated up to the outside edge of the central plant area for protection. Outside the plant area these lines are buried 2 ft. below grade. At the present time gas-injection lines are laid to three input wells. In this system there are about 3,000 ft. of 3-in. lines.

Foundations.—In designing the concrete foundations and footings, the soil loading was based on carrying 4,000 lb. per sq. ft. at depth of 6 ft. below grade. The entire surface area of the plant was given a finish grade to provide good drainage of water during the rainy season.

Maintenance.—A number of gantries or trolley rails are permanently installed in the new plant to provide for removal of tube bundles where the heat exchangers are stacked one over the other, and to provide body cover handling for the stacked exchangers. Trolley rails are provided over all vertical lift pumps to facilitate maintenance and repair.

Central control house.—This building is 80 ft. long, 23 ft. wide and is sectionalized into four parts: (1) the control room proper; (2) plant laboratory; (3) change room and toilets; (4) plant offices. Walls and partitions of the building are of hollow-tile construction and 8 in. in thickness. The inside is finished in plaster with the floor areas made of concrete and having a metalicron finish marked in 12-in. squares. The building has forced ventilation, with all the air being filtered.

Gas compressor house.—These buildings have forced ventilation and all air is filtered. Dimensions are 100 by 31 ft.

Electrical power plant.—Constructed directly adjacent to the stabilization - desalting - pressure maintenance operations. The large steel building contains two 5,000-kva. alternators. The plant is designed to accommodate for future expansion; present plans contemplate installation of another 5,000-kva. generator in 1950. The current is produced at a potential of 6,900 volts. The three steam generators at the plant have a capacity of 80,000 lb. an hour and operate at 400° F.

QUESTIONS on TECHNOLOGY

by W. L. Nelson
Consulting Engineer

Inflammability Limits Of Mixtures

What are the explosive limits of mixtures of carbon monoxide, methane, oxygen, carbon dioxide, nitrogen, and water vapor?—R. W. H.

The computation of the inflammability limits of mixtures is laborious but the results are thought to be adequately accurate. Such computations are necessary in handling catalyst-regenerator gases, engine-exhaust gases, blast-furnace gas, gases from explosives, mine-fire gases, and in general in atmospheres after fires or explosions. An excellent discussion is given in the Vapor Recovery Systems Co. Handbook and Catalog No. P-7. Much of the following is taken from this handbook.

The inflammability limits of many pairs of mixtures have been studied as indicated in Fig. 1. After selecting various pairs of mixtures to represent the actual gas, the limits of the entire mixture is computed from the following equation:

$$L = \frac{100}{\frac{P_1}{N_1} + \frac{P_2}{N_2} + \frac{P_3}{N_3} + \ldots}$$

where, P_1, P_2, P_3, etc., are the percentages of the several pairs of mixtures; N_1, N_2, N_3, etc., are the explosive limits of the respective pairs; and L is the inflammability of the total mixture.

However, the computations are not simple, and hence the following example from Handbook P-7 is given:

1. The composition of a gas is given in Table 1.

TABLE 1—MINE-GAS ATMOSPHERE

Constituent—	Per cent	Air-free per cent
Carbon dioxide	13.8	15.9
Oxygen	2.8	zero
Carbon monoxide	4.3	5.0
Methane	3.3	3.8
Hydrogen	4.9	5.7
Nitrogen	70.9	69.6

The air-free column of Table 1 was computed by noting that the air in the mixture is:

$$\frac{2.8}{0.209} = 13.4 \text{ per cent}$$

and therefore the air-free mixture is 86.6 per cent. The gases, except oxygen and nitrogen, were therefore divided by 0.866 to obtain the composition of the mixture on an air-free basis.

2. The inflammable gases are then paired off with the carbon dioxide or nitrogen in various proportions, but utilizing all of the carbon dioxide and all of the nitrogen. One such pairing is indicated in Table 2.

The pairing of the mixtures is confusing but fortunately some latitude of choice is possible without introducing serious errors. In general, the ratio of inert to inflammable gas must not be so high that the mixture falls outside the extreme right of the curve on Fig. 1.

In Table 2 the ratios of "inert to combustible" were computed as for the carbon monoxide—nitrogen pair:

$$\frac{17.5}{5} = 3.5$$

The explosive limits as in the last two columns of Table 2 were read from Fig. 1, or for the first pair 61 and 73 per cent.

3. The limits of the four pairs of gases of Table 2 are then combined by means of the equation. Thus for the lower limit:

$$\text{Lower L} = \frac{100}{\frac{22.5}{61} + \frac{24.7}{36} + \frac{34.2}{50} + \frac{18.6}{32}} = 43 \text{ per cent}$$

TABLE 2—PAIRING OF INFLAMMABLE GASES WITH INERTS

Combustible—	Per cent	Carbon dioxide (%)	Nitrogen (%)	Pair (%)	Ratio, inert to combustible	Limits* Low	Limits* High
CO	5.0	....	17.5	22.5	3.5	61	73.0
CH_4	3.8	....	20.9	24.7	5.5	36	41.5
H_2	5.7	3.0	....	31.2	10.4	50	76.0
		2.7	....	18.6	5.9	32	64.0
Total		15.9	69.6	100.0			

*Read from Fig. 1.

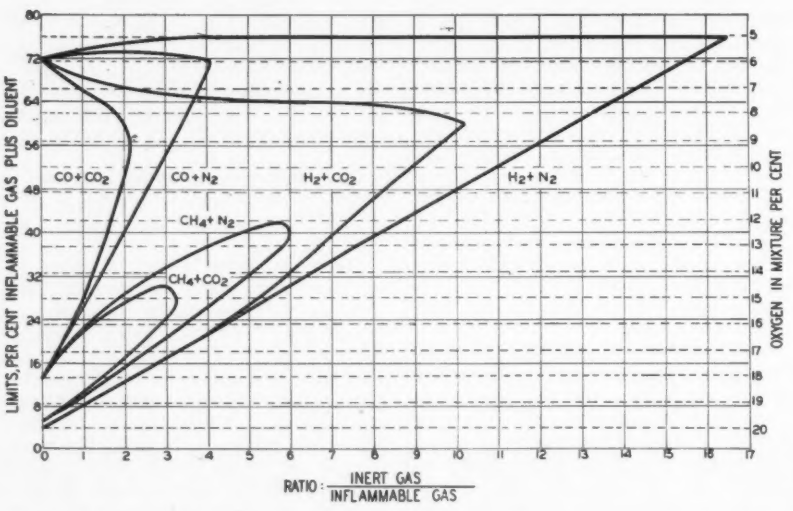

Fig. 1—Inflammability limits of hydrogen, carbon monoxide, and methane with various amounts of inert gases. (Vapor Recovery Systems Co.)

A similar computation based on the upper limits shows an upper limit for the mixture of 61 per cent. This means that the limits of the air-free mixture are 43 and 61 per cent.

4. The limits of the actual mixture are different because of the air that it contains. Thus,

Higher L. = 43/0.866 = 50 per cent
Lower L. = 61/0.866 = 70 per cent

Finally, if the amount of inert gas is so large that a complete series of inflammable pairs cannot be dissected, the air-free mixture is noninflammable—and if the last computation indicates that limits are larger than 100 for both limits, then the mixture is noninflammable. If, however, the higher limit is over 100 and the lower is below 100, then the mixture has an inflammability range ending at 100 per cent.

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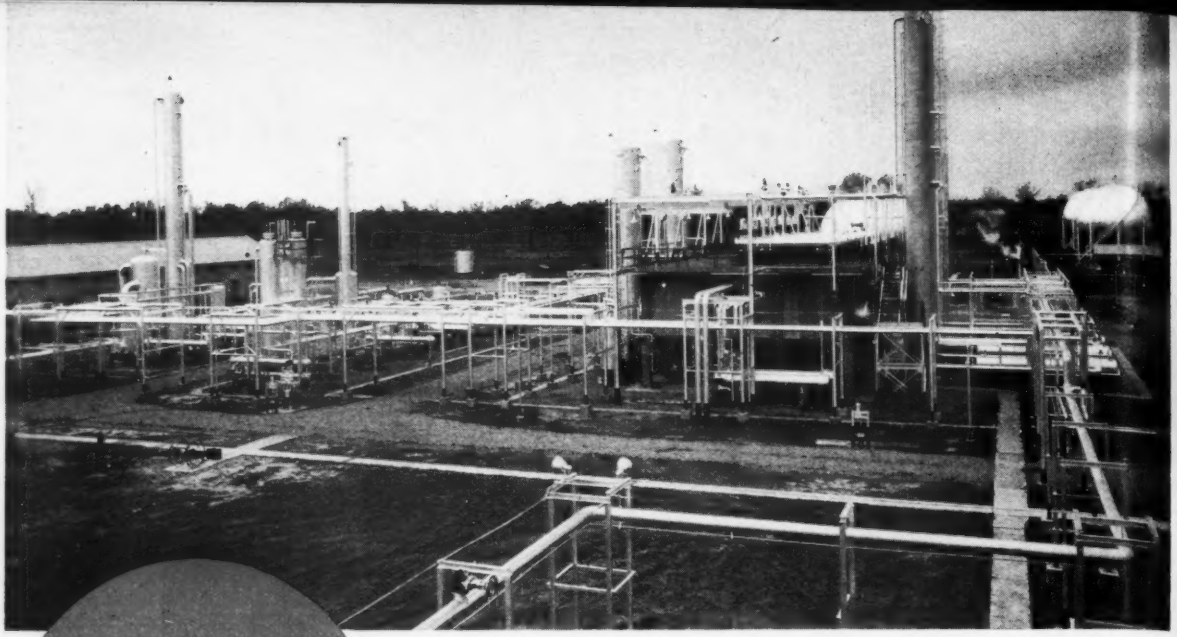
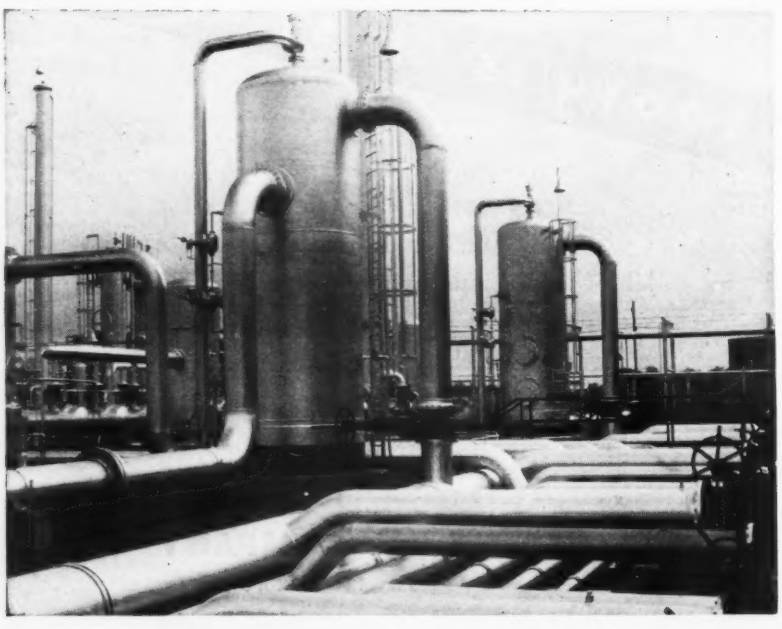


Sun's

Natural-Gasoline Plant Serves Three Fields in Northern Louisiana

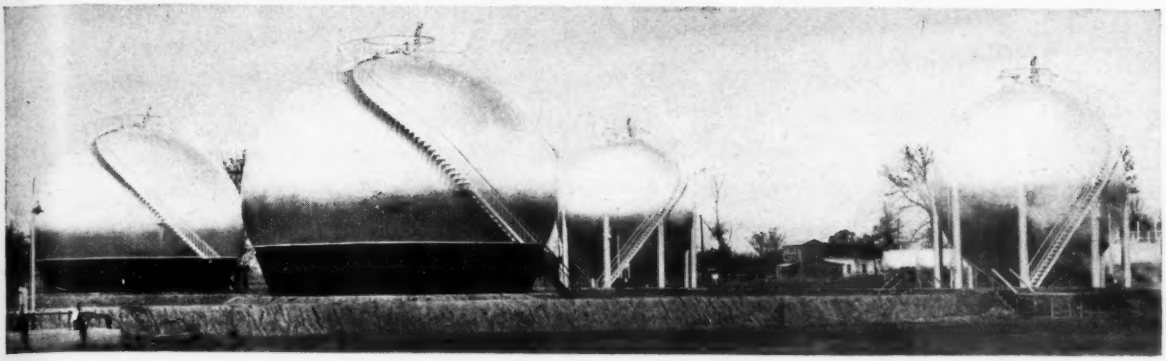
by D. H. Stormont



View of the two big 84-in. by 18-ft. gas scrubbers, on the incoming 16 and 26-in. lines

BY means of the many modern features incorporated in the design of the recently completed natural-gasoline plant in the Delhi field area of northern Louisiana, Sun Oil Co. and other operators are recovering in excess of 60 per cent of the propane content of the natural gas charged to the plant, 95 per cent of all butanes, and substantially all of the pentanes and heavier. This relatively high percentage of propane recovery is accomplished without refrigeration of either the gas or absorption oil; it results from several modern provisions in the plant's design.

The main absorbers are equipped with intercoolers so that a substantial portion of the heat of absorption is removed, resulting in a cooler oil stream and more efficient absorption of the propane vapors. (Later, if a greater degree and more selective adsorption of propane-butane fractions is desired, the intercoolers will be utilized for chilling the partially enriched absorption oil by means of propane refrigeration.) Rich oil from the high-pressure absorbers is flashed



At left are two 10,000-bbl. Hortonspheroids, at right two 5,000-bbl. Hortonspheres, comprising part of the extensive storage facilities

before passing through a four-unit battery of heat exchangers and again when halfway through the exchangers. Vapors flashed from the rich oil in these two tanks are then passed through a reabsorber where they are further stripped of their propane fractions.

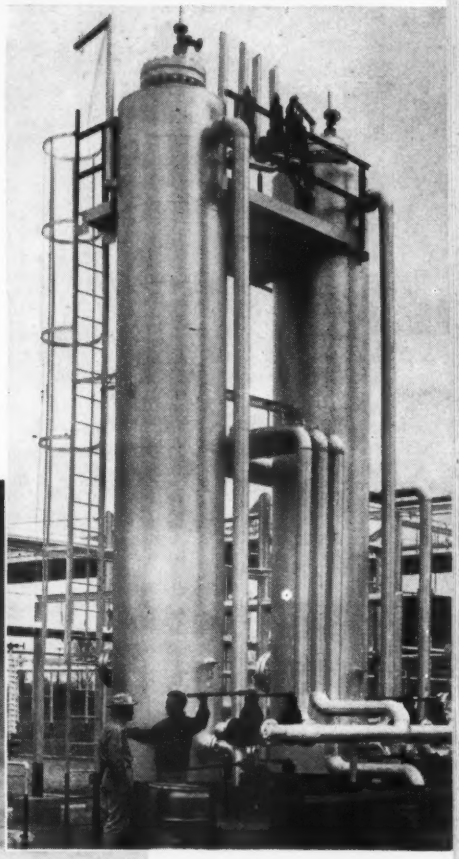
A two-stage distillation system permits use of high condenser pressures in order more completely to condense the distillation products and minimize recycle loads, and at the same time have the advantage of low pressures for more economical stripping of the absorption oil. The rich oil is only partially stripped in the high-pressure still, but sufficient lighter constituents are removed overhead to permit the secondary still to operate totally condensing at 40 psi. Practically all of the methane and ethane and a substantial portion of the propane are eliminated from the stream charged to the low-pressure still by taking these materials over the top of the high-pressure still.

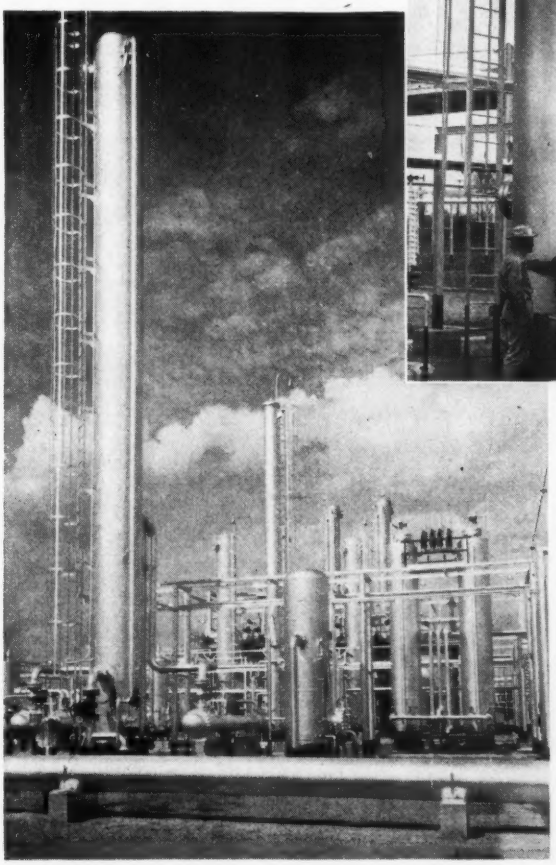
The partially cooled overhead vapors from both stills join at the inlet to the final condenser, where the low volatility of the low-pressure still products assists in condensing the vapors from the high-pressure still. All recycle vapors are then taken from the raw-gasoline surge tank to the third-stage suction scrubber where they join cooled gas from the second-stage compression cylinders. Thus as much methane and ethane as possible are eliminated from the recycle vapors while retaining the bulk of propane and heavier constituents.

Gas Gathering and Compression

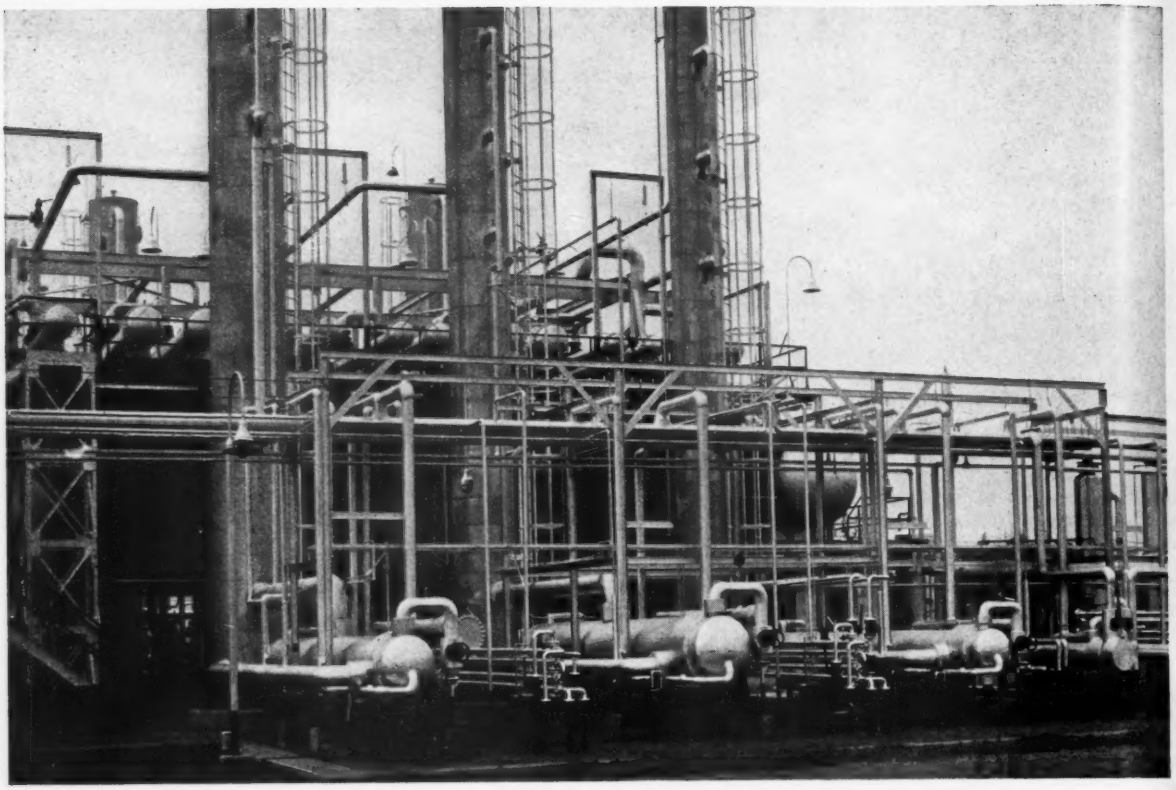
Practically all of the gas produced by the 350 oil wells in Delhi, West Delhi, and Big Creek fields, currently about 15,000,000 cu. ft. daily is processed in the new Delhi plant. The three fields were named before their several producing sands were known to overlap in a continuous producing area extending 18 miles through Madison, Richland, and Franklin parishes. Delhi and West Delhi are now classed as one field, and Big Creek, although it adjoins West Delhi, is considered separate. It produces largely from the Price and Howard sands (Tuscaloosa) and about 2,600 ft., while Delhi field's principal pays are in the Holt-Bryant zone (Tuscaloosa and Paluxy) at some 600 ft. greater depth. The field is generally regarded as the most important oil-producing stratigraphic trap to be discovered since East Texas.

Field gas is brought to the plant through two main lines. The line running to the northeast portion of the field is of 16-in. pipe, while the main to the southwestern area is a 26-in. line. A typical analysis of the gas





Above: Size of the two bauxite dehydrating towers is afforded by comparison with the two operators at the piping manifold. Left: Here the dehydrating units are shown as they appear in conjunction with part of the other process equipment



These photographs show some of the

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installed in the Delhi, Louisiana plant of the

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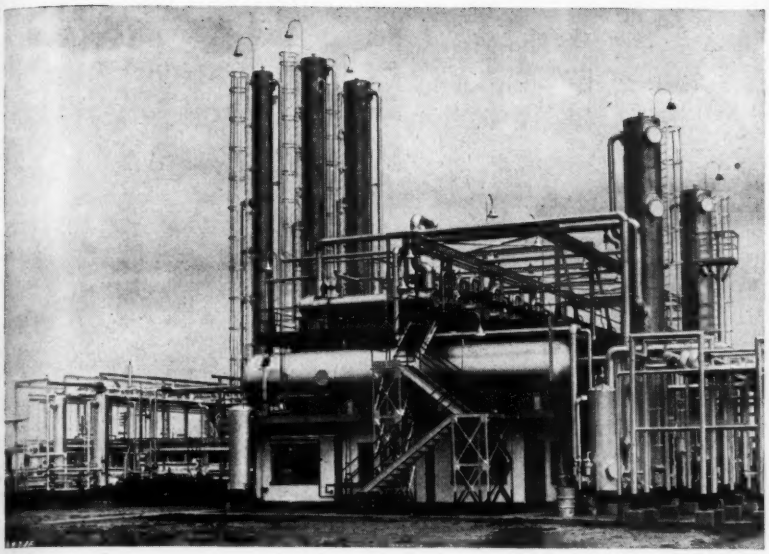


Process lines are of minimum length in the central process area, which is laid out so that all heat exchangers, condensers, and coolers are readily accessible for maintenance

being handled, and of the residue gas discharged from the plant, is shown as an inset table in the flow diagram.

The gas is brought to the plant under vacuum, and after passing through one of two 84-in. by 18-ft. scrubbers it enters the header from which the low-pressure cylinders of four 1,000-hp., three-stage, type GMV-10 Cooper-Bessemer compressors take suction. From an average inlet of about 10 in. vacuum, the gas is compressed to 30 psi. in the first stage, from 25 to 130 psi. in the second stage, and from 125 to 550 psi. in the third stage. Gas is intercooled and scrubbed after each compression stage, leaving the third-stage discharge scrubber and entering the high-pressure absorber at a temperature of 90° F. and 545 psi. As shown in the accompanying flow diagram, material condensed in the high-stage coolers is allowed to enter the absorber along with the gas. Water only is trapped in the third-stage discharge scrubber.

Each of the four compressors is equipped with three low-stage cylinders, one interstage cylinder, and one high-stage cylinder. Their sizes are 22½ by 14 in., 21 by 14 in., and 11 by 14 in., respectively.

A speed and suction-pressure control arrangement included in the compressor system automatically adjusts the speed of the machines in accordance with changes in the volume of gas being compressed. These controls consist of three separate pilots connected to the suction side of the machines. One operates the speed control on the machines while the other two operate butterfly valves in the field gas mains.

The speed-control pilot sets the engine governors in order to maintain a constant inlet pressure on the compressors. At any time when there is adequate capacity in the operating machines to handle all incoming gas at about 10 in. Hg. vacuum, the speed control functions to limit the operating speed to some point below the maximum for which the units were designed and the maximum governor setting. If the gas load goes down the tendency would be to pull more vacuum. The pressure control, however, functions to set the governors to cause a lower engine speed. Conversely, if the gas load increases the pressure on the suction side tends to rise and the control functions to speed up the engines.

Absorption and Stripping

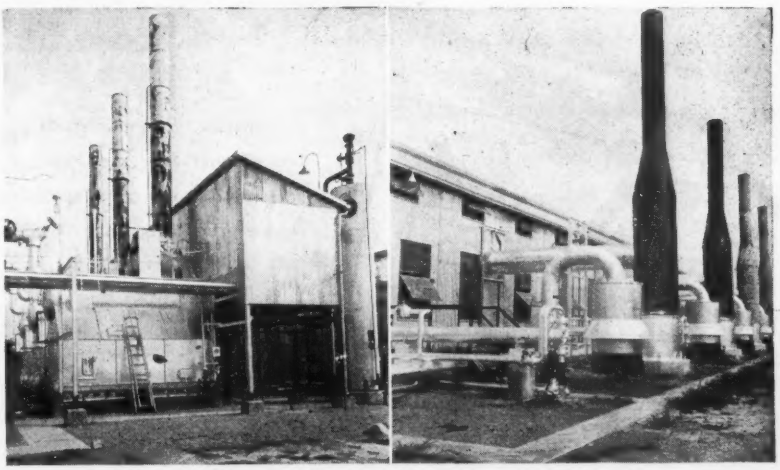
The high-pressure absorber, operated at 540 psi., is 48 in. in diameter and contains 24 trays. Lean oil enters at near the top at the rate of 170 g.p.m., and in descending is twice intercooled with water as previously explained. A liquid-level controller operated motor valve regulates the flow of rich oil from the base of the absorber. The stripped gas is taken overhead to a residue scrubber from where it enters the plant residue line or the plant fuel system.

The rich oil is flashed at about 220 psi. before entering the heat-exchange section and to 205 psi. when halfway through the heat exchangers. Gas released in these flash tanks is taken to the base of the reabsorber where some 60 g.p.m. of lean oil further strip the gas of its gasoline fractions. The reabsorber is operated at about 200 psi. Residue gas from the reabsorber after passing through a scrubber goes to the plant fuel line.

Lean oil from both the high-pressure absorber and the reabsorber is pumped by a single steam-turbine-driven centrifugal pump. The turbine is rated at 110 hp. at 3,600 r.p.m. The six-stage centrifugal pump discharges, through a tap, some 60 g.p.m. at 235 psi. to the reabsorber, and 170 g.p.m. of lean oil to the high-pressure absorber at a pressure of 585 psi.

Rich oil from the reabsorber joins that from the main absorber after the latter has passed through the second flash tank. The combined streams, after passing through the second section of heat exchangers and through a third flash tank, flow to the high-pressure still.

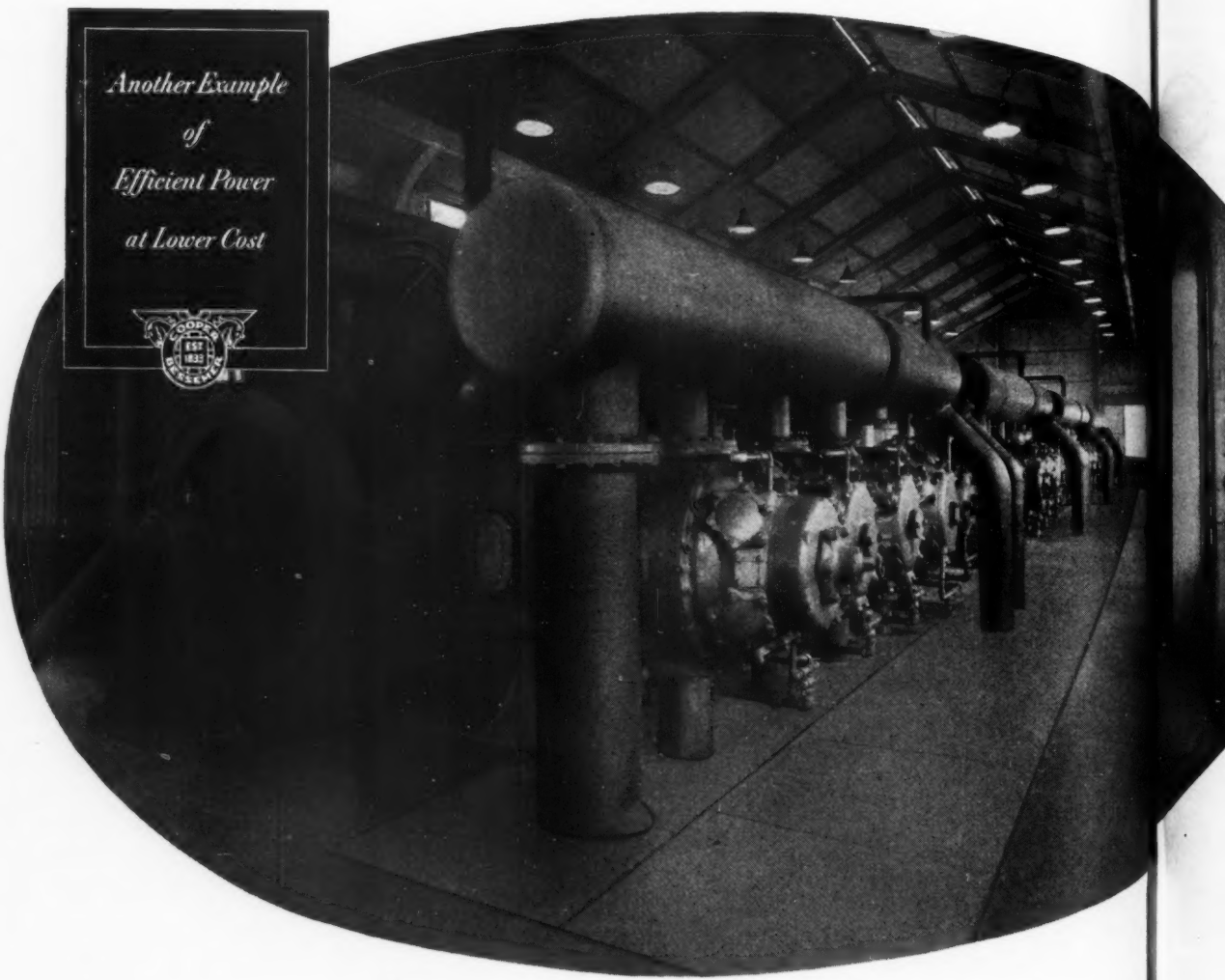
This still is operated at about 150 psi., and is used in conjunction with a low-pressure still (40 psi.) as earlier described. Distillation heat for both stills is supplied entirely by steam, the high-pressure unit requiring some 1,390 lb. per hour of 325-psi. steam for operation of the external reboiler. Both stills use agitation steam to assist in the vaporization of materials in the stripping section. Sufficient reflux, about 38 g.p.m., is



Left: Three 160-hp. water-tube boilers with superheaters. Right: Intake air filters, exhaust silencers, and lube-oil and jacket-water exchangers are at convenient outdoor settings

New Delhi plant

Another Example of Efficient Power at Lower Cost



Automatically controlled at this new plant in the Delhi field, these four Cooper-Bessemer 1000 hp GMVs each have 5 compressor cylinders for 3-stage compression from 10 inches vacuum to 550 psi. Plant is now processing some 14 million cu. ft. of gas daily from 350 wells.

ANGLE V

Compressors b

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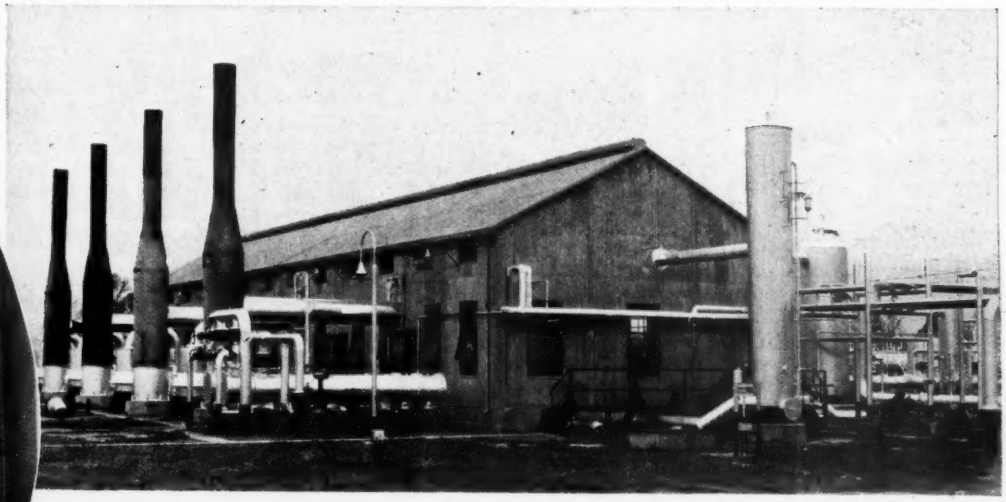

...with GMV Automatic Control

About 14 million feet of gas is processed daily . . . and with exceptionally high recovery of hydrocarbons . . . at a new natural gasoline plant in the Delhi field of Louisiana. The plant construction and operation is under the supervision of the Sun Oil Company.

This capacity is reached with only four 1000 hp Cooper-Bessemer GMV compressors . . . and will soon be increased by the addition of a fifth unit, bringing the plant total to 5,000 GMV horsepower.

Here, as in many other GMV installations, automatic control greatly simplifies the operation. Engine speed is automatically adjusted by speed and pressure controls for continuous output at maximum capacity as influenced by gas supply. Yes, the operators are making the most of compressor capacity.

As you plan *your* future operations, it might pay you to look into the features that have been developed for the automatic control of Cooper-Bessemer V-angles—new, often exclusive features that broaden control limitations and provide for greater-than-ever economies.

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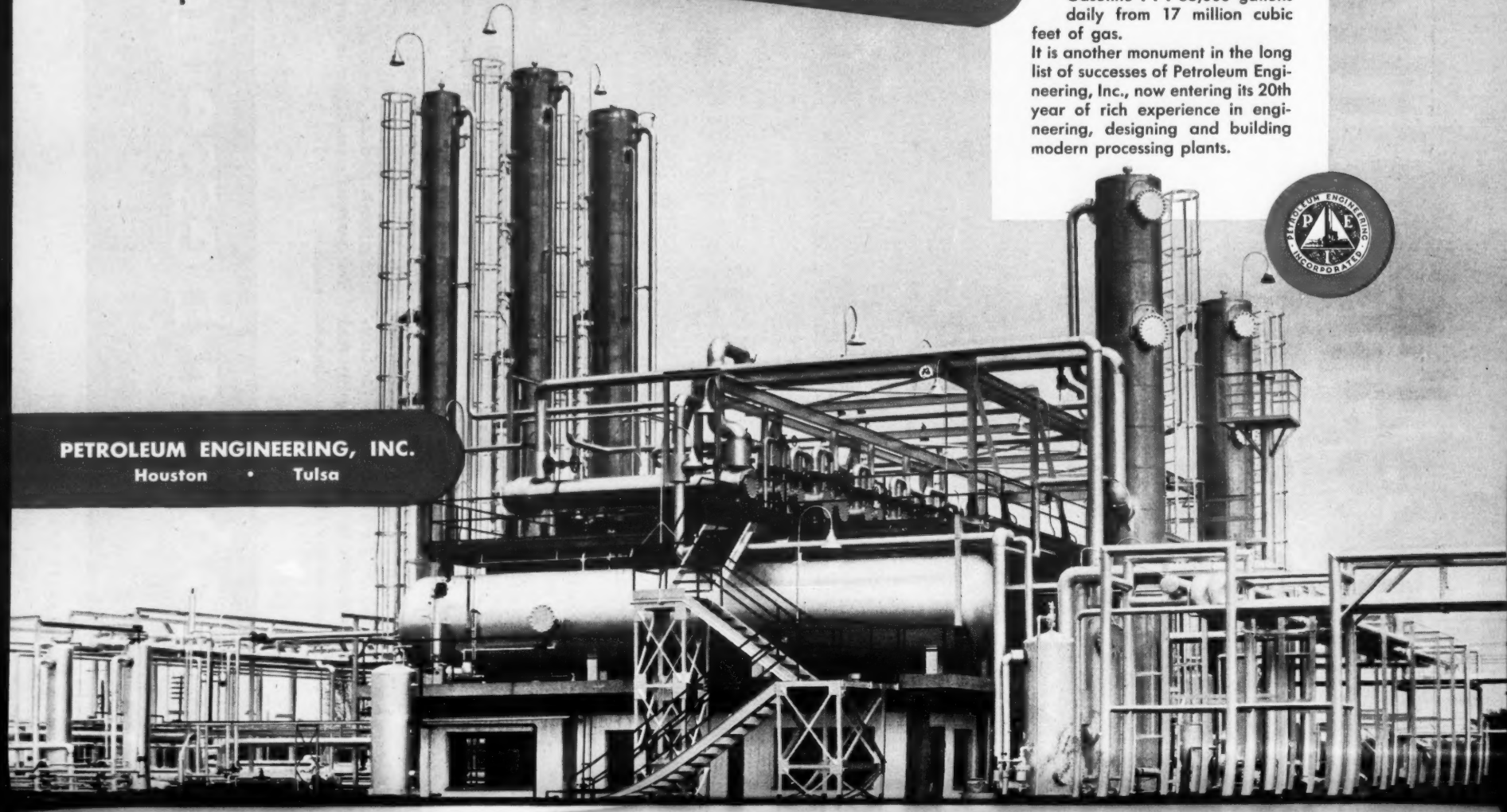
DELHI PLANT of Sun Oil

Pictured here is the Distillation and Fractionator Group of Sun Oil Company's Delhi Plant for the production of Propane, Butane and Natural Gasoline . . . 85,000 gallons daily from 17 million cubic feet of gas.

It is another monument in the long list of successes of Petroleum Engineering, Inc., now entering its 20th year of rich experience in engineering, designing and building modern processing plants.



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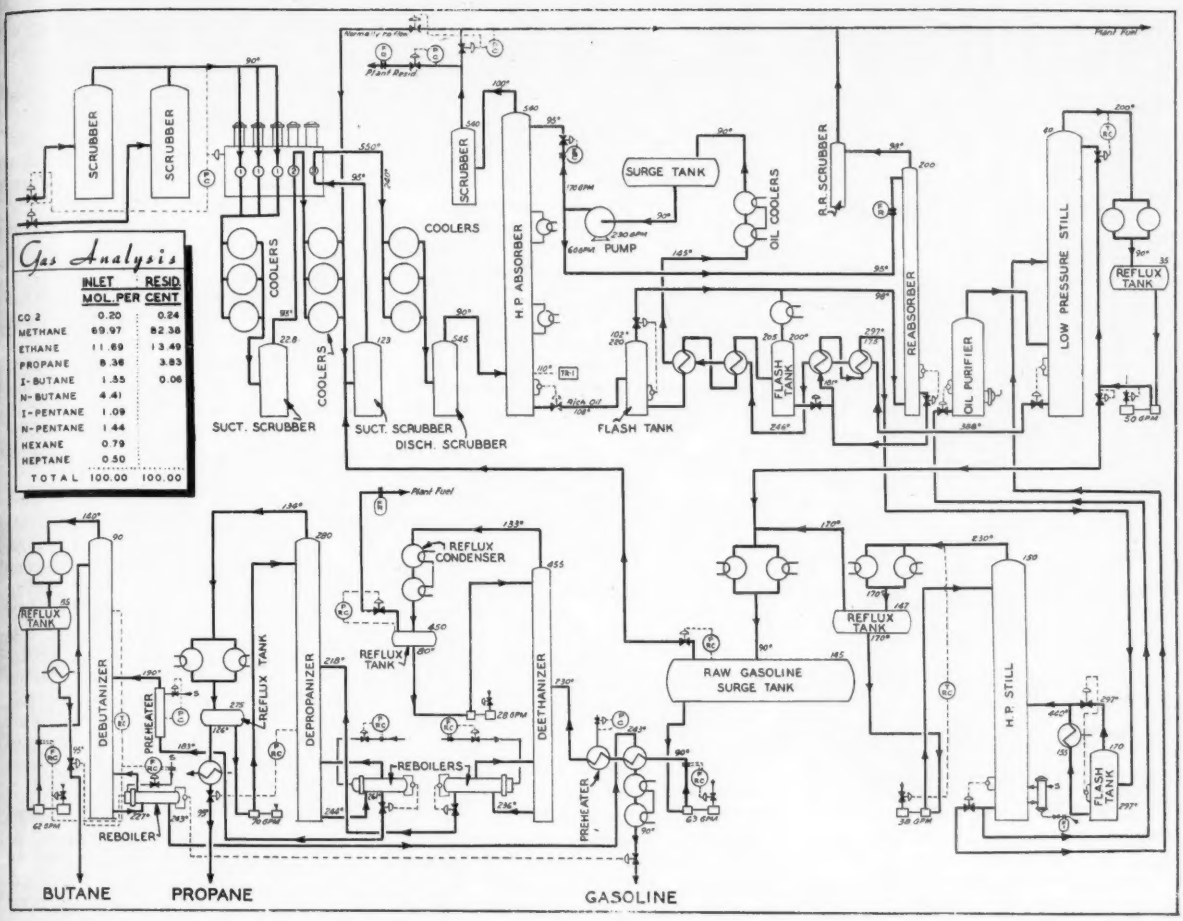


Equipment and process flow for the new natural-gasoline plant at Delhi, La. Gas analysis data are given in the inset table

condensed and pumped into the top section of the high-pressure still to maintain a tower-top temperature of around 230° F. Temperature of the low-pressure still is held as high as possible, around 200° F., and enough process or agitation steam used to satisfactorily strip the absorption oil.

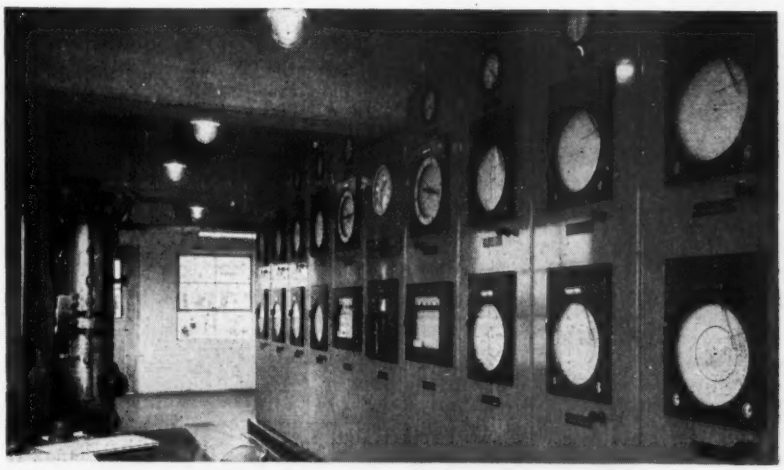
Bulk of the partially denuded oil from the high-pressure still is taken directly to the low-pressure still for further stripping. A small portion of it, however, flows to an oil purifier operated in conjunction with the low-pressure still. A liquid-level controlled valve near the bottom of the oil purifier regulates the volume of oil flow into this vessel.

High-pressure steam circulating through an internal reboiler and additional low-pressure agitation steam together supply the heat necessary to distill the absorption oil. These oil vapors, along with any absorbed gasoline fractions, are taken overhead from the purifier to the low-pressure still. Impurities such as solids and high-boiling-point fractions remain in the base of the vessel and are removed about once a week.

The partially cooled condensed overhead from the low-pressure still is united with the overhead vapors from the high-pressure still just before entering the final condenser, from which they drop to the raw-gasoline surge tank. A pressure of about 145 psi. is maintained on this vessel. Light ends escaping from the gasoline pass through a pressure-controlled valve and enter the plant's recycle system as outlined earlier.

Conventional fractionating methods and equipment are used to separate the raw gasoline into its propane, butane, and natural-gasoline fractions. All fractionating columns, as well as the two stills, employ the flooded condenser-type reflux and are operated totally condensing.

Raw gasoline from the surge tank



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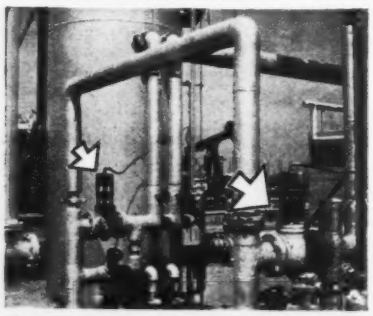
Valve sizes ¼" to 2" have double unions; 2½ to 6" have flanged ends. Write for prices. (P-48)

Below: Regulators Controlling Separators and Treaters.



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is picked up by the deethanizer feed pump and passed through a shell-and-tube exchanger (heated by stabilized gasoline from the debutanizer) and through a preheater, entering the deethanizer at a temperature of about 230° F. A pressure of 455 psi. is held on the deethanizer, while top-tower temperature maintained approximates 133° F. and the base temperature 236° F. Deethanizer overhead vapors pass to a reflux drum and excess over reflux needs is utilized as boiler fuel.

Bottoms from the deethanizer pass to the depropanizer at about 280 psi., via. level controls on the reboilers. The depropanizer top temperature is controlled at 135° F. while the reboiler temperature averages about 261° F. Bottoms from this tower in turn pass to the debutanizer. Overhead propane vapors in excess of reflux requirements are further cooled and run to storage.

Feed to the debutanizer, exiting through level controls on the depropanizer reboiler, is further preheated and enters the debutanizer at about 190° F. This column operates at 90 psi., with a reboiler temperature of 243° F. and a tower-top temperature of 140° F. Butone vapors taken overhead are condensed, cooled, and run to storage. Butane-free gasoline is removed through the reboiler, cooled, and also run to storage.

Results from a typical day's operation show that when processing 14,000,000 cu. ft. of gas daily the following yields are obtained: 19,700 gal. of propane, 21,200 gal. of butane, and 20,800 gal. of natural gasoline.

Auxiliary Facilities

For storing the 12-lb. vapor-pressure natural gasoline two 10,000-bbl. Hortonspheroids are used, and for storing butane output two 5,000-bbl. Hortonspheres were erected. A total of 260,000 gal. storage is provided for propane in horizontal cylindrical tanks and two 40,000-gal. tanks provided storage for the 100-lb. L.P.G. A modern 12-car loading rack was constructed on the right-of-way of the nearby Illinois Central Railroad, and in the plant yard two two-truck racks supply the local demand for L.P.G.

Water for the plant's operation is provided by two deep wells which supply some 150 g.p.m. Cooling of all water is accomplished in a four-unit, induced-draft Pritchard cooling tower, designed for cooling 4,750 g.p.m. from 110° to 85° F. All coolers and condensers used are of the shell-and-tube type, with the heated water being returned to the cooling-tower well. Steam-turbine-driven centrifugal pumps are used for pumping water over the tower. Process and stripping steam is provided by three 160-hp., Type A Wickes forced-draft boilers, each capable of generating 25,600 lb. of steam per hour at 325 psi. and 100° superheat. A sulfuric acid-phosphate system is used for treating makeup water added to the boilers.

High-pressure steam for operation of the turbo pumps and process towers exhausts into a 55-psi. steam-distribution system. This system in turn exhausts into a 5-psi. system for return to the feed-water preheater. The feed-water pump is steam-turbine driven with a motor-driven unit as a standby.

The compressor engines are cooled by a closed water-circulating system designed to carry a fixed inlet and outlet jacket-water temperature. The jacket water is cooled by heat exchange with raw cooling water in closed shell-and-tube exchangers. The engines have individual lube-oil coolers and filters.

Purchased electric power is used for motor-driven pumps, plant lighting, and miscellaneous other uses. As a standby power source, a gas-engine-driven generator is used. Rating on this unit, which generates 480-volt, three-phase, 60-cycle current, is 250 kva. at 1,200 r.p.m. The standby unit is operated only during storms or at other times when a power failure may occur. Controls on this unit permit it to automatically take up the plant load as the purchased power drops off.

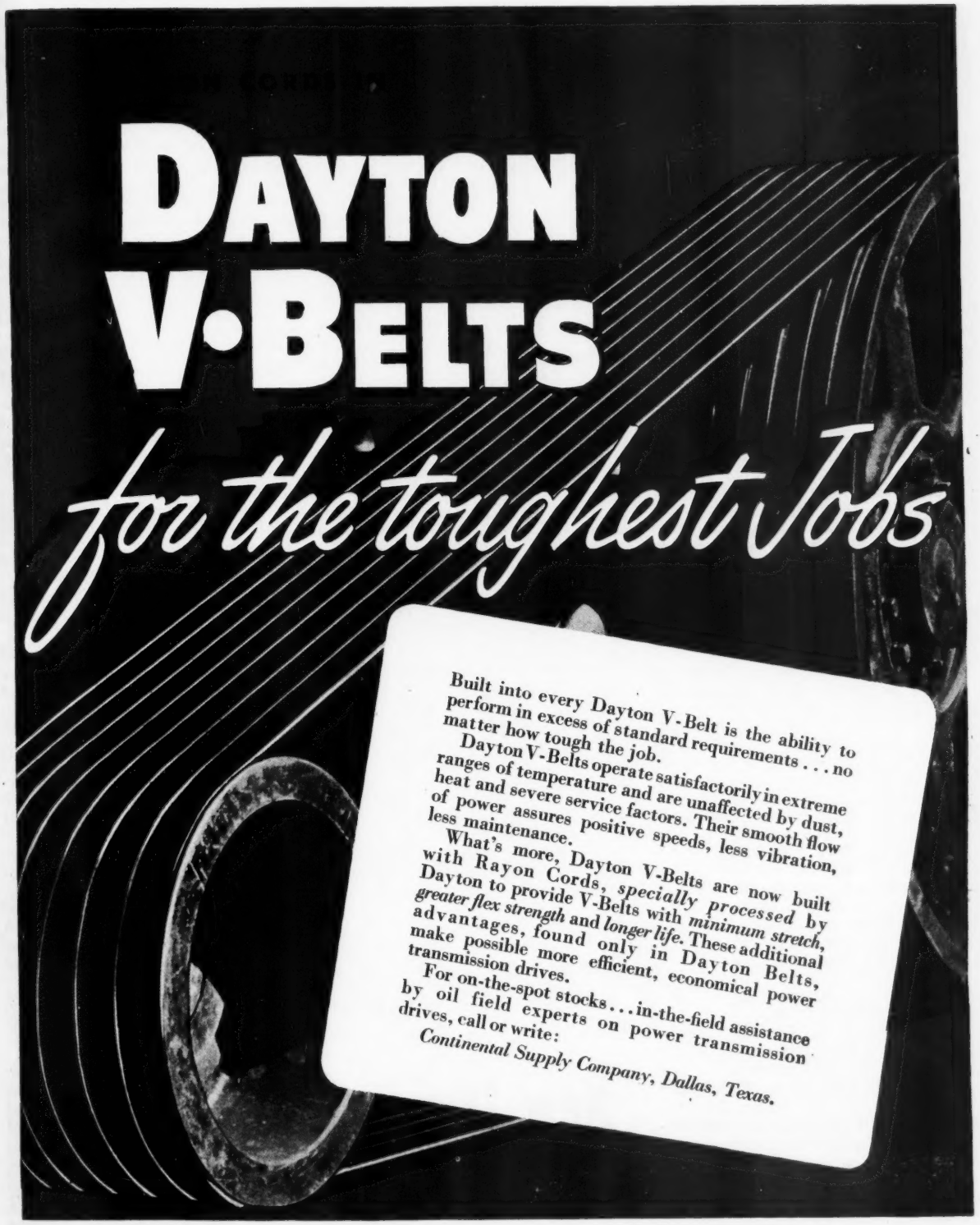
Residue gas from the plant is completely dehydrated in a bauxite dehydrating tower. Two such units are provided so that one tower takes the full gas load while the other is being regenerated with hot residue. Several gas wells in the field are also connected into the plant residue gas system. Any gas that they supply to meet the contracted delivery volume is also passed through the dehydrating system.

The new Delhi plant was designed and constructed by Petroleum Engineering, Inc., of Tulsa and Houston. J W. Cole is superintendent for Sun Oil Co. at the plant; M. W. Crockett is chief engineer; H. O. Evinger, assistant superintendent; and E. R. Pace is chief chemist.

A.P.I. Publishes Uniform Radioactivity Log Forms

American Petroleum Institute's division of production has announced publication of a recommended practice for a standard radioactivity log form for use in recording the data obtained from surveys of deep wells.

The log form was drawn up to ensure adequate and uniform reports so that the information collected could be interpreted properly now and in the future. It was pointed out that many of the various forms used in early-day electrical logging lacked sufficient information to interpret in the light of later developments.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Houdriflow

New Design in Catalytic Cracking

HOUDRIFLOW is the name given to the new improved moving-bed catalytic cracking process recently developed by Houdry Process Corp. While Houdriflow retains desirable features from the T.C.C. process (licensed by Houdry Co. since 1941), it differs from T.C.C. design in four major respects:

1. Method of transporting catalyst.
2. Range of catalyst circulation rates available.
3. Simplification of regenerator.
4. Physical arrangement of principal vessels.

The four major new features of the Houdriflow design will be discussed below:

1. Flue-gas lift.—This system transports pelleted or bead catalyst from the bottom to the top of the unit, replacing the bucket-type elevator of the conventional T.C.C. process. The feasibility of lifting pelleted catalyst with air or flue gas has been demonstrated by extensive work on pilot and commercial-scale apparatus. The utilization of the lift

(a) Removes the practical limitation on catalyst circulation rate presently imposed by bucket-type elevators, making available a wide range of circulation rates, and

(b) Simplifies the means of transporting catalyst, eliminating mechanical devices.

2. Catalyst to oil ratios.—These run in the range of 4 to 8 whereas conventional T.C.C. units operate in the range of 2 to 3 due to elevator-capacity limitations. This range of catalyst-to-oil ratios permits operation with stocks from zero to 100 per cent vaporized and a reduction in the amount of reactor feed-preparation equipment, since a major portion of the reaction heat is supplied by the catalyst entering the reactor.

3. Simplified regenerator.—This is made possible by the higher catalyst-circulation rates. Since a major portion of the regeneration heat is absorbed by the flowing catalyst, one or two burning zones are sufficient; whereas, conventional T.C.C. units use 7 to 10. No sacrifice of flexibility in regenerator operation is entailed by these modifications.

4. Principal vessels.—A superimposed, self-supporting, circular reactor and regenerator section is the fourth distinguishing feature of Houdriflow. This arrangement of the principal vessels

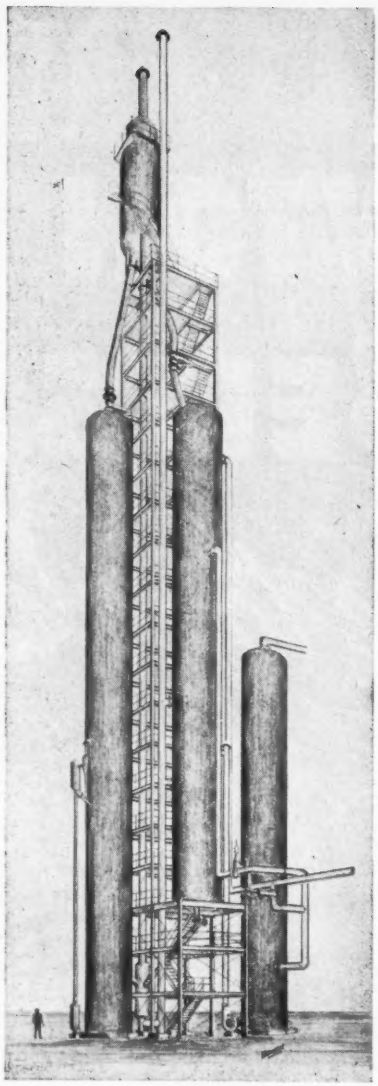
(a) Makes it necessary to lift the catalyst only once to complete a cycle of flow through the system, and

(b) Results in a smaller ground area requiremcnt for the installation of a unit of a given capacity.

Initial capital investment for a Houdriflow unit is approximately 80 per cent of that of a conventional T.C.C. unit of the same capacity, due to the simplifications in the regenerator, the means of transporting catalyst, and the physical arrangement of equipment. Moreover, greater flexibility with respect to reactor operating conditions and type of charging stock is provided. Additional economies also can be foreseen in that direct operating costs as well as maintenance costs will be materially reduced. The following table illustrates the economic advantages of Houdriflow over the conventional T.C.C. The comparison was made of units of 5,000 bbl. per stream day capacity.

Utilities savings	$260 per day
Catalyst savings	—$42 per day
Maintenance savings	$39 per day
Amortization savings	$217 per day
Total savings	$474 per day

These advantages stem from the simplification in design. For example, a lower fuel requirement for reactor feed preparation accounts for a significant reduction in operating costs. Likewise, it is evident that the new kiln with a minimum of internal structural elements will require even less maintenance than a T.C.C. kiln.



Description of Process

To trace the principal flows through a Houdriflow unit, reference is made to the accompanying flow diagram. Regenerated pelleted or bead catalyst in the upper lift hopper (A) flows by gravity through the reactor seal leg (B) into the catalyst distributing head of reactor (C). From this point the catalyst enters the reaction zone via two paths. An annular orifice located in the center of the top seal plate permits approximately 80 per cent of the catalyst to enter the reaction zone in the form of an annular curtain which surrounds the mixed-phase reactor charge injection nozzle. The remainder of the catalyst flows through a number of peripheral catalyst feed pipes, the length of which determines the height of the bed of catalyst in the reactor.

Continuing to flow by gravity, the catalyst passes downward through the reaction zone, through vapor-disengaging and steam purging sections in the bottom of the reactor. It then goes by way of seal leg (D) into the distributing head of kiln (E). The spent catalyst flows into the kiln proper through a distributor designed to insure uniform distribution, and continues downward through two solid-bed regeneration zones.

Leaving the bottom of the kiln, the catalyst flows by gravity through seal leg (F) into the lower lift hopper (G) from which point it is transported by means of flue gas from the kiln through the vertical lift pipe (H) into upper lift hopper (A). This completes a cycle of catalyst flow. As in the conventional T.C.C. process, a small

stream of catalyst from hopper (A) is continuously bypassed to the elutriator (J) where "fines" are removed by air classification to maintain the average particle size of the catalyst in the system at the desired value.

The oil charging stock may be delivered to the Houdriflow reactor in the liquid phase, in a partially vaporized state, or in a completely vaporized state. The more general case of partially vaporized or mixed-phase feed is assumed for this description. In such instance, any feed stock suitable for catalytic processing is preheated by heat exchange and a fired preheater to a nominal preheat temperature of perhaps 700° F. The mixture then flows directly through reactor charge line (K) into an injection nozzle, located centrally in the top of the reaction zone and inside the annular curtain of flowing catalyst described in the preceding paragraph.

Mixed-Phase Feed Atomized

By means of the injection nozzle, the mixed-phase feed is atomized and directed onto the annular curtain of hot catalyst which immediately completes the vaporization of the charge and brings the temperature of the vapor-catalyst mixture to the desired level for reaction. The hydrocarbon vapors then pass downward concurrently with the catalyst through a solid-bed reaction zone.

In the reaction zone efficient contact between vapors and catalyst is achieved. The cracked vapors of synthetic crude leave the reaction zone via a catalyst-vapor disengager device in the lower part of the reactor, and flow to a conventional fractionation and recovery plant.

The coked or spent catalyst, after passing through the vapor disengaging zone, flows through a simple but efficient steam purging section. By the countercurrent flow of steam to catalyst, stripping of residual hydrocarbons is achieved and even with the heaviest reactor charge stocks, no extractable material remains on the catalyst. There are no innovations in the design of the vapor-catalyst disengager or the steam purge section, both being standard T.C.C. features.

A small flow of steam into the head of the reactor, automatically regulated by a recording flow controller, maintains a seal at the top of the reactor to prevent the escape of hydrocarbon vapors up seal leg (B) and similarly the purge steam in the bottom of the reactor precludes the possibility of escape of cracked vapors through seal leg (D) into the regenerator.

Air for regeneration of the spent catalyst, supplied by blower (M) at about 10 psig., bypasses the air heater (N), which is used for start-up only, and enters the kiln (E) through a channel-type distributor. Approximately half of the air flows upward countercurrently to the catalyst through the upper burning zone and the remainder of the air flows concurrently with the catalyst through the lower burning zone. This description applies to the design shown. Several minor variations are possible and have been incorporated in other commercial designs.

Flue gases from the upper burning zone disengage above the catalyst distributor, leave the top of the regenerator, and enter the main flue-gas duct. Flue gases from the lower burning zone leave the bottom of the regenerator by way of a channel-type collector and also enter the main flue-gas duct. A bank of cooling coils (P) removes regeneration heat as required to maintain desired catalyst temperatures. Pump (Q) circulates cooling water through the coils from the steam flash drum (R). The amount of heat absorbed by the cooling water may be regulated by the number of coils in service.

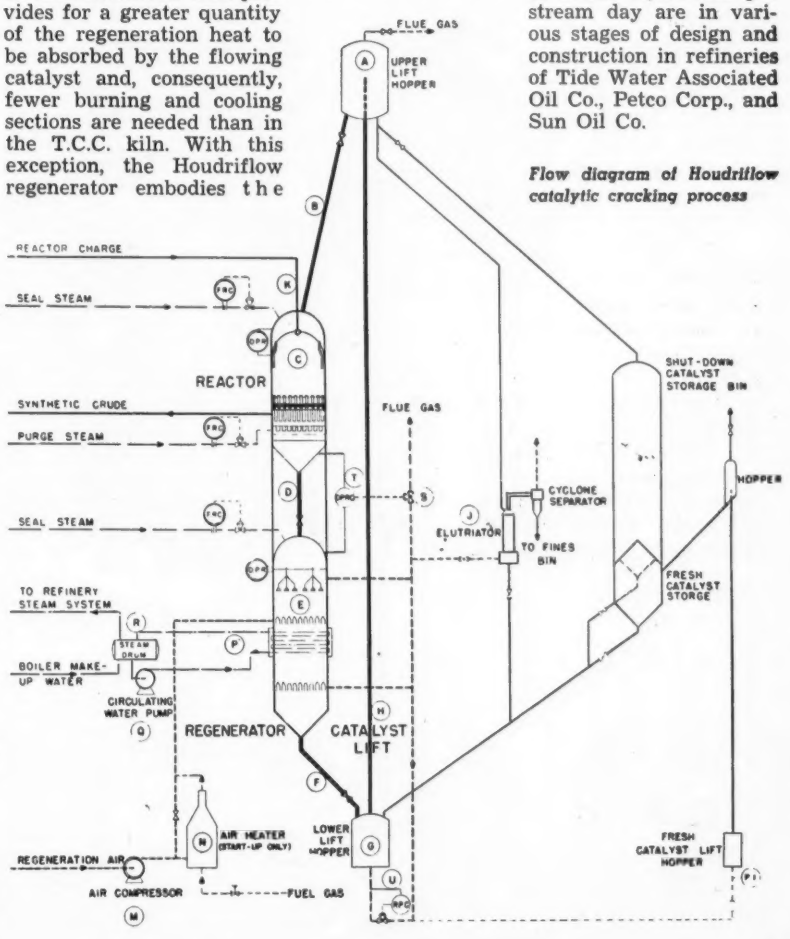
Pressure in the range of 5 to 9 psig. is maintained in the regenerator by means of the flue-gas control valve (S), which is positioned by the differential pressure recorder controller (T). A seal to prevent the escape of flue gas up seal leg (D) is maintained by an automatically regulated flow of steam into the head of the regenerator.

The higher rate of flow of catalyst in the Houdriflow kiln provides for a greater quantity of the regeneration heat to be absorbed by the flowing catalyst and, consequently, fewer burning and cooling sections are needed than in the T.C.C. kiln. With this exception, the Houdriflow regenerator embodies the same principles as the improved design of T.C.C. kiln in use today.

Approximately half of the flue gas from the kiln flows from the main flue gas duct to the lower catalyst lift hopper to be used for transportation for the catalyst. Most of the remainder of the flue gas is vented directly to the atmosphere, a small portion of it being diverted to the elutriator for pneumatic classification of the catalyst and removal of fines.

The flue gas for the catalyst lift enters the lower lift hopper through pressure controller (U), engages and carries the catalyst up the lift pipe to the upper lift hopper (A), and from this point is vented to the atmosphere. Experience on both small and commercial-scale gas lifts employing pelleted and bead catalyst has shown that catalyst flow rates may be closely controlled by appropriate regulation of the flue gas and catalyst velocities in the lift pipe. Furthermore, it has been demonstrated that catalyst losses due to attrition may be easily maintained in the range of 0.01 to 0.02 weight per cent of the catalyst-circulation rate. This is roughly equivalent to 0.2 lb. per barrel of reactor throughput.

At this time Houdriflow units representing a total processing capacity of about 40,000 bbl. per stream day are in various stages of design and construction in refineries of Tide Water Associated Oil Co., Petco Corp., and Sun Oil Co.



Flow diagram of Houdriflow catalytic cracking process

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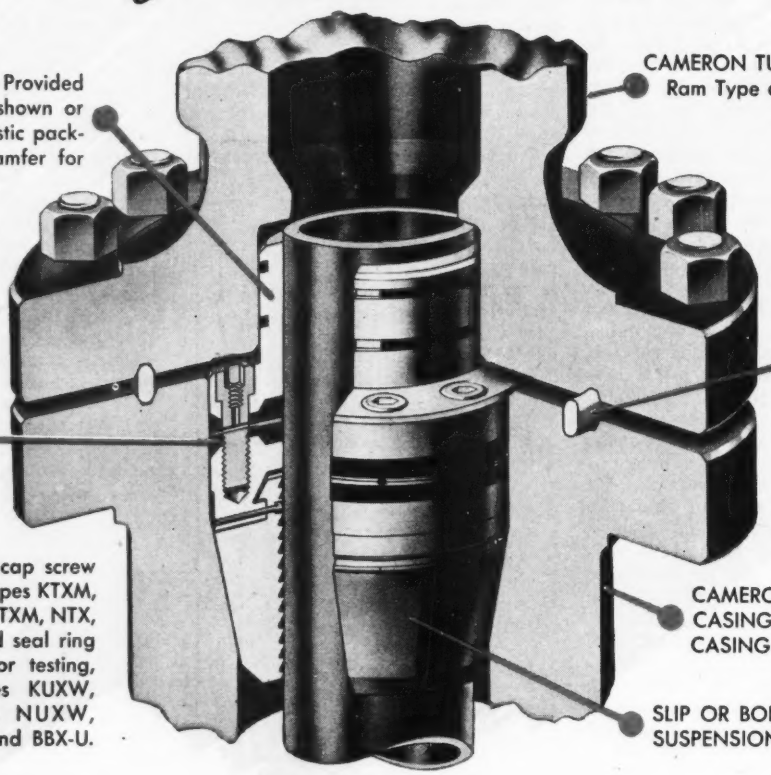

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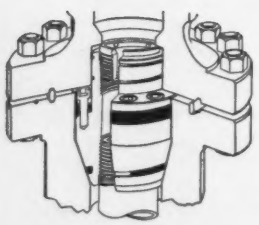

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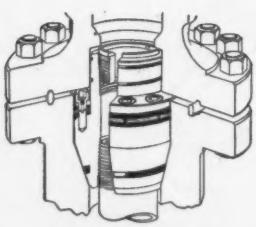

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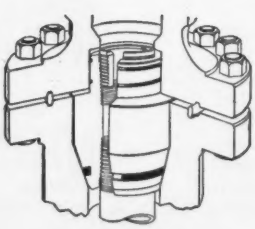

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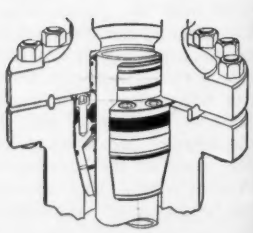

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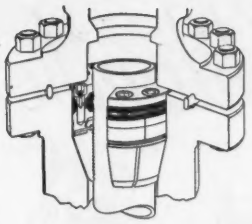

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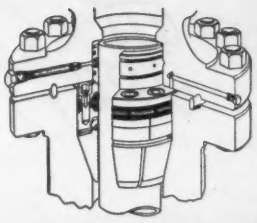

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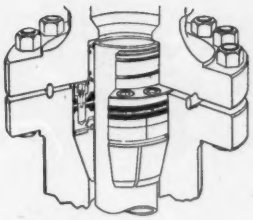

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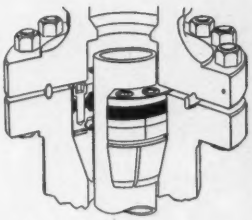

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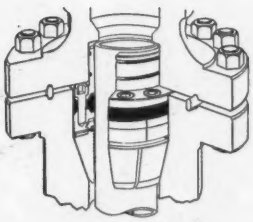

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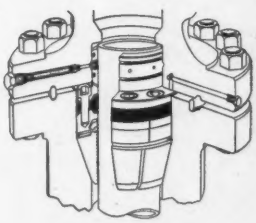

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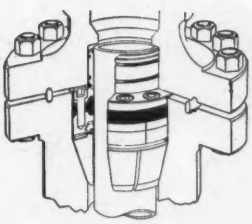

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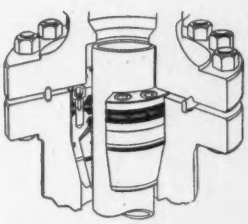

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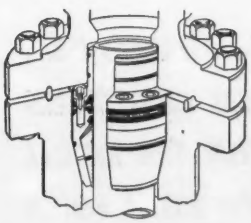

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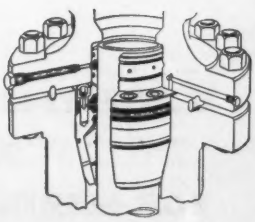

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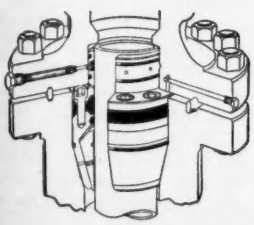

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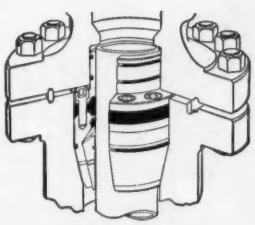

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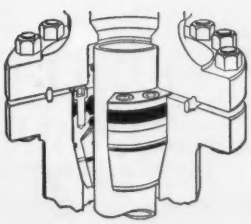

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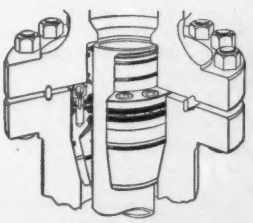

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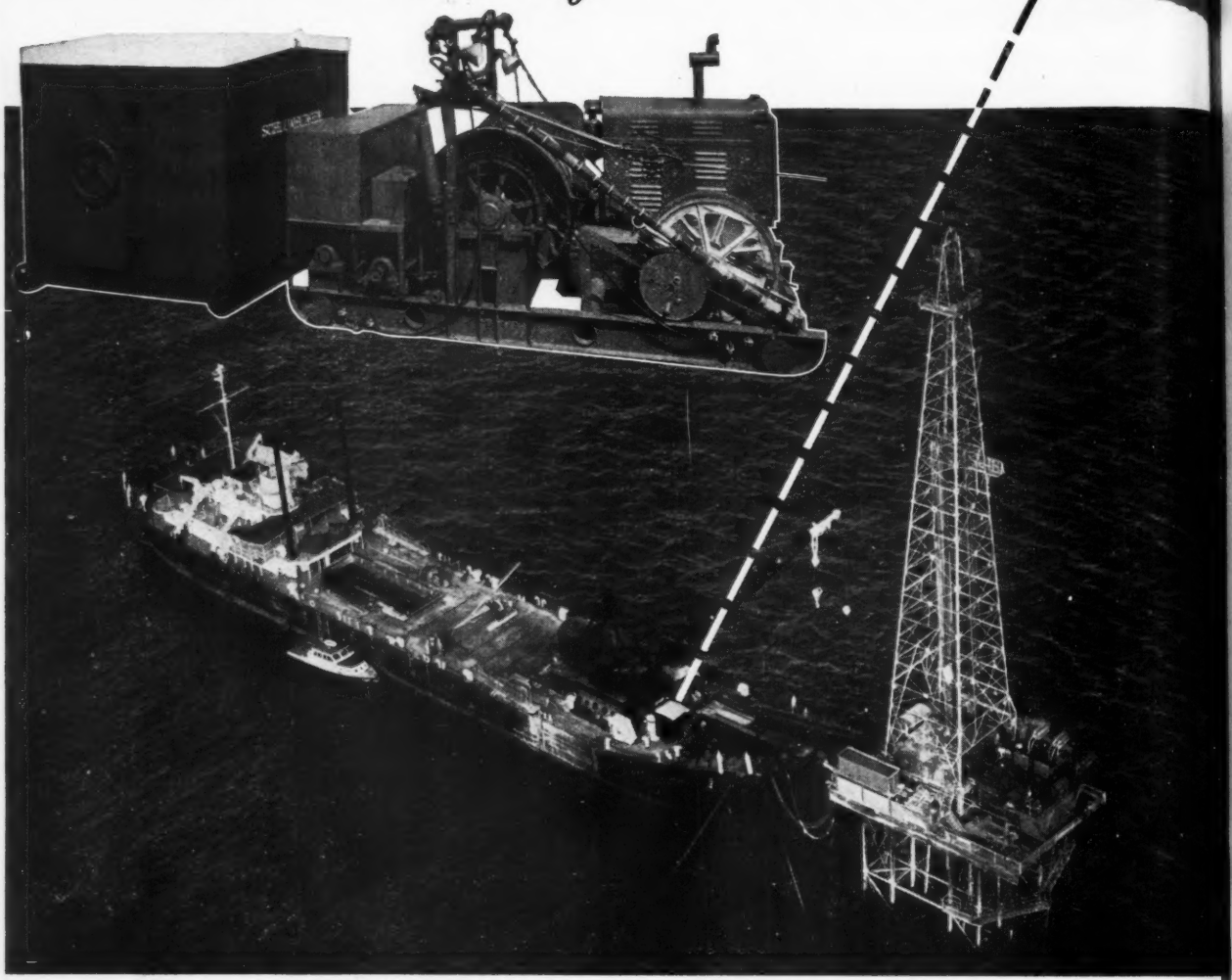

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CORROSION INHIBITION with Chromate

A SERIES — By MARC DARRIN

1. Introduction and General Data

IT has been estimated that the world's annual corrosion bill is between 2 and 6 billion dollars of which more than a tenth is paid by the oil and gas industries. These estimates are based on the cost of equipment fabricated from iron and steel, and the rates of replacement due to corrosive attack. Since these figures do not include attendant wastage of other materials and labor, it is believed that the actual economic loss may be substantially greater.

The oil and gas industries have done much to reduce this loss by the use of better steels and corrosion-resistant alloys, but it is becoming increasingly evident that there is not enough corrosion-resistant metal to meet the requirements. Nor could these alloys be the complete answer, because their use, in places subject to the most severe corrosion, may transfer the attack to nearby susceptible ferrous surfaces. The petroleum engineer has employed corrosion-resistant paints and cathodic protection, but these methods are limited in their application.

Chromate inhibits corrosion by treating the cause rather than the symptoms, and thus is basically different from remedies such as those mentioned above. A small dosage of chromate causes an otherwise corrosive water to become noncorrosive and simultaneously deposits a protective film. It is actually a dual treatment: it renders the water noncorrosive, and at the same time makes the surface corrosion-resistant.

Established Uses of Chromate Inhibitors

More than 20 years ago, Roetheli and Speller[1] showed that bichromate inhibits corrosion of iron and galvanized steel in chloride solutions. This investigation was sponsored by the American Society of Refrigerating Engineers through a grant to Massachusetts Institute of Technology. Shortly thereafter A.S.R.E.[2] recommended the use of sodium bichromate in brines. This resulted in outstanding savings in equipment, lower power consumption and increased output, due to cleaner heat-exchange surfaces and elimination of costly shutdowns.[3] Similar results are being obtained with spray washers and cooling towers which are used in air conditioning,[4] and with jacket-water systems for internal-combustion engines.[5] This treatment is providing good protection in many other recirculating water systems such as those used with hydroblast equipment, air washers for electrical equipment and the like, also for cooling furnace doors, welding machines, steel roll mills, rubber mill rolls and glass-forming machines. Although chromate corrosion inhibitors are used chiefly in recirculating systems, they have applications in noncirculating systems which may be quiescent as in standby boilers, or semiquiescent as in gas holders,[6] or surging as in hydraulic lifts and presses.

Similar applications exist in the petroleum and natural-gas industries, but there is less standardization for combating some types of corrosion because of the great variety of corrosion causes in different fields. The primary purpose of this report is to aid in the solution of these problems. There is no single curative for all types of corrosion and, although this report relates to conditions which may be remedied by the use of chromate, other conditions are pointed out where chromate is inapplicable.

Valency of Chromium Compounds

Three states of valency are known: divalent, trivalent, and hexavalent. The divalent or chromous state is unstable and only encountered in the laboratory and electrochemical processes. Certain references in the literature concerning the use of divalent chromium compounds for corrosion control are in error. These divalent compounds are quickly oxidized by atmospheric oxygen and could not exist under ordinary conditions. For practical purposes only the hexavalent and trivalent states need be considered.

Chemically pure sodium or potassium chromates and bichromates, also chromic acid, contain hexavalent chromium. These chemicals vary in color from yellow to red. The corrosion-inhibiting value of a soluble chromium compounds is proportional to its content of hexavalent chromium.

Trivalent or chromic compounds result from the reduction of hexavalent compounds. These reduced products are green in color and have little or no inhibiting power, although they do enter into the formation of protective films which are self-healing while in a water system containing hexavalent ions (chromate). The film formed on steel consists essentially of hydrous chromic-ferric oxides. In this connection it is interesting to note that chromium is an amphoteric element, and that the

Marc Darrin, chief research chemist, Mutual Chemical Co. of America, Baltimore, is an authority on the technology of chromium chemicals. His research investigations include the behavior of chromate corrosion inhibitors in chloride systems, studies on bimetallic corrosion, evaluation of corrosion criteria and the dual theory of passivation. He is an active member of A.S.T.M. corrosion committees, Corrosion Section of Electrochemical Society, National Association of Corrosion Engineers, and Fellow American Institute of Chemists. He obtained his chemical engineering degree from University of Washington, later became Industrial Fellow at Mellon Institute.

Other articles in this series will deal with corrosion inhibition with chromate, as to: (2) Drilling-Production, (3) Processing Plants, (4) Pipe Lines.

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trivalent chromic cations may unite with hexavalent chromate anions to form chromic chromates. These are dark brown insoluble compounds, and there is some evidence that they have a role in the formation of protective films.

Concentrated Solutions

When the application is of a kind which makes it desirable to employ a concentrated solution, sodium bichomate is better than sodium chromate, particularly if cold, because the bichromate has greater solubility. At a concentration of 69 per cent by weight, there is no separation of bichromate at temperatures above —40° F., while at +30° F. saturation occurs at less than 25 per cent chromate. For hot solutions the difference is less, the solubility of chromate at 150° F. being 55 per cent.

Chemical Activity

From the chemical viewpoint the bichromates are more reactive than the chromates, and are consumed more rapidly when reducing substances are present. From the corrosion-inhibitive viewpoint the chromates are a little better than the unneutralized bichromates, but both possess inhibitive properties of the same general order, and there is no objection to the substitution of bichromate for chromate when individual applications are of a kind where this is advantageous. As will be shown presently there is no difference between chromate and bichromate solutions when adjusted to the same pH. The equilibrium between chromate and bichromate ions depends on pH.

Chromate vs. Bichromate

The choice between these chemicals is largely one of cost versus convenience since their solutions are identical when adjusted to the same pH. In general it is best to keep the pH between 7.5 and 9.5, although substantial protection may be obtained at both lower and higher pH. Usually a chromate solution requires no adjustment to bring it within the optimal range, but it is customary to add soda ash or caustic soda to raise the pH of a bichromate solution. About 27 lb. of caustic soda is required for each 100-lb. bag of bichromate, the precise amount depending on the natural alkalinity of the water.

$$\underset{298}{Na_2Cr_2O_7 \cdot 2H_2O} + \underset{80}{2NaOH}$$

$$= \underset{324}{2Na_2CrO_4} + \underset{54}{3H_2O}$$

From the above equation it may be calculated that 1 lb. of sodium bichromate is equivalent to 1.087 lb. of sodium chromate. Bichromate also costs less per pound. The ordinary technical grades are used and may be added in solid form, or in solution as may be most convenient. Of course solid caustic should not be added to hot water because of danger of spattering.

If bichromate does not possess sufficient acidity to lower the alkalinity to the desired pH, for example as may occur in a refrigerating brine, it is sometimes desirable to substitute chromic acid (CrO_3) for part of the bichromate. This is preferable to adjusting with hydrochloric acid because the chromic acid itself is an inhibitor. One pound of chromic acid will neutralize excess alkalinity equivalent to 0.8 lb. NaOH, while 1 lb. of sodium bichromate will neutralize only 0.27 lb. NaOH. When neutralized, it requires 0.671 lb. of chromic acid to be equivalent in corrosion-inhibiting value to 1 lb. of sodium bichromate. Similarly the equivalent quantities of potassium salts are 0.987 lb. $K_2Cr_2O_7$ or 1.303 lb. K_2CrO_4, each equal in corrosion-inhibiting value to 1 lb. of sodium bichromate. All of these chromium chemicals are commonly supplied in an anhydrous form with the exception of sodium bichromate which is a dihydrate.

Bimetallic Corrosion

Reference frequently is made to corrosion resulting from bimetallic contact, particularly between brass and iron. Of course, the best way to combat this type of corrosion is to eliminate dissimilar metals, but this is often impractical for structural reasons or because of existing installations. A partial remedy is to insulate the cathodic metal by painting it. It is less helpful to paint steel or iron (anodic metal) near contact with brass, since this may increase the density of the resulting galvanic current at unavoidable breaks in the coating and thus intensify pitting, or it may transfer corrosion to some other anodic area.

Although it is best to avoid dissimilar metals, and higher concentrations of chromate usually are required in bimetallic systems, little difficulty is encountered in protecting iron or steel equipment having only a few contacts with brass. Some extremely bad bimetallic combinations (aluminum-copper or zinc-copper), though benefited, cannot be completely inhibited by chromate, especially when corroding media are hot or contain chlorides.[7]

The amount of chromate required for an all-aluminum system is substantially lower than for all-iron. An all-galvanized system also requires less chromate, provided contacts with copper or brass are avoided. If iron is exposed in a galvanized system, the same concentration of chromate as for an all-iron system is safe. Sometimes a little less chromate may be employed, since the inhibiting action of the chromate is supplemented by the zinc which gives additional protection to nearby iron. Chromate, in addition to passivating the iron, may deposit a protective film of zinc chromate on the galvanized surface, thus protecting both the iron and zinc simultaneously.[5]

Even when condensers and other heat-transfer equipment are constructed of corrosion-resistant material, the use of chromate is desirable, since the external piping and pumps which circulate the water are made almost universally of iron and steel, and chromate is required to inhibit corrosion of these parts. Besides the chromate increases the life of parts made from corrosion-resistant metals such as bronze, nickel, stainless steel, copper, monel, brass, tin, and lead.

Aeration

Water which courses through cooling towers or spray washers is saturated with atmospheric oxygen. Unless chromate is present, this aeration creates a condition which may result in accelerated attack. Laboratory and field trials have shown that the efficiency of chromate is unaffected by aeration. This is because chromates are oxidants which passivate through a mechanism known as anodic polarization, an electrochemical process presumably due to the formation of an insulating layer of oxygen on the surface of the metal. Later this inhibition is reinforced with a layer of metal oxide. In some instances hexavalent chromium also is retained in the protective film.[7]

Effect of Relative Humidity

Under strongly dehydrating conditions, as may be encountered in a deep gas well, a solution of sodium bichromate has less tendency to lose water, and separate as a solid, than a sodium chromate solution. On the other hand, if these chemicals are kept in a solid form in a moist atmosphere, neither sodium chromate nor sodium bichromate is satisfactory. For example, at 70° F. sodium bichromate absorbs moisture if the relative humidity is over 52 per cent. Under these conditions it becomes sticky and eventually liquefies. Under similar conditions sodium chromate does not deliquesce but tends to cake to a very hard mass. Although the actual percentages of moisture taken up by these compounds is comparatively small and does not affect their corrosion-inhibitive value, it does make them difficult to handle. For this reason, when a free-flowing powder mixture is required, it is better to use potassium salts, either potassium bichromate or potassium chromate, which are essentially unaffected by atmospheric moisture.

Estimating Cost

Since all technical grades of chromium chemicals made by Mutual assay over 99 per cent, it may be as-

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sumed for purpose of calculation of practical dosages that pure chemical compounds are being used. Current prices are listed in most chemical trade journals. Concentrations figured as parts per million may be converted to pounds per gallon, or pounds per cubic foot, or other practical units by means of the accompanying conversion table. As previously mentioned, the corrosion-inhibiting strength of chromium compounds, under any particular set of conditions, after adjusting to the same pH, is directly proportional to the amount of hexavalent chromium, which may be calculated from the following equivalents of 1 lb. of sodium bichromate, $Na_2Cr_2O_7 . 2H_2O$.

	Lb.
Anhydrous sodium bichromate, $Na_2Cr_2O_7$	0.8791
Sodium chromate, Na_2CrO_4	1.0871
Potassium bichromate, $K_2Cr_2O_7$	0.9871
Potassium chromate, K_2CrO_4	1.3032
Chromic acid, CrO_3	0.6711

CONVERSION TABLE

P.p.m.	Grams per liter	% by wt.	Oz. per 100 gal.	Lb. per 100 gal.	Lb. per 1,000 cu. ft.
100	0.10	0.01	1.3	0.08	6.2
200	0.20	0.02	2.7	0.17	12.5
300	0.30	0.03	4.0	0.25	18.7
400	0.40	0.04	5.3	0.33	25.0
500	0.50	0.05	6.7	0.42	31.2
600	0.60	0.06	8.0	0.50	37.4
700	0.70	0.07	9.3	0.58	43.7
800	0.80	0.08	10.7	0.67	49.9
900	0.90	0.09	12.0	0.75	56.1
1,000	1.00	0.10	13.3	0.83	62.4
1,500	1.50	0.15	20.0	1.25	93.6
2,000	2.00	0.20	26.7	1.67	124.7
2,500	2.50	0.25	33.3	2.08	155.9
3,000	3.00	0.30	40.0	2.50	187.1
3,500	3.50	0.35	46.7	2.92	218.3
4,000	4.00	0.40	53.4	3.33	249.5
4,500	4.50	0.45	60.0	3.75	280.7
5,000	5.00	0.50	66.7	4.17	311.8

Grams per liter	Oz. per gal.	Lb. per gal.	Lb. per cu. ft.
5	0.67	0.042	0.312
10	1.33	0.083	0.624
15	2.00	0.125	0.935
20	2.67	0.167	1.247
25	3.33	0.209	1.560
30	4.00	0.250	1.871
35	4.67	0.292	2.183
40	5.33	0.333	2.495
45	6.00	0.375	2.807
50	6.67	0.417	3.118
55	7.34	0.459	3.430
60	8.00	0.500	3.742
65	8.67	0.542	4.054
70	9.34	0.584	4.366
75	10.00	0.625	4.778
80	10.67	0.667	4.990
85	11.34	0.709	5.302
90	12.00	0.750	5.613
95	12.67	0.792	5.925
100	13.34	0.834	6.237

Explanatory note: The above is based on the weight and volume relationship of pure water at 60° F., i.e., 8.337 lb. per gal. (7.481 gal. per cu. ft.), with no allowance for dissolved solids. Thus the values for parts per million and per cent by weight are approximations, but are sufficiently accurate for practical comparison purposes at low concentration, such as in the case of chromate added for corrosion control. Another common term for expressing concentration is milligrams per liter, which is the same numerically as parts per million, subject to the foregoing limitation.

Inhibitive Paints

As a result of intensified wartime research, the outstanding merit of zinc yellow (basic potassium zinc chromate, $K_2O.4ZnO_3.4CrO_3.3H_2O$)[8] has been demonstrated by its wide use on aircraft and naval vessels. It is unexcelled as an inhibitive pigment for equipment or structures fabricated from iron, steel, aluminum, and many other metals. Other chromate-containing inhibitive pigments are in various stages of development. These include complex chromates of the alkaline-earth metals. At the present time, practically all paint manufacturers are prepared to supply zinc chromate inhibitive paints ready to apply by brush, spray, or dip. For the most part these paints contain, in addition to a chromate pigment, smaller proportions of iron oxide and magnesium silicate which appear to be beneficial. The vehicle generally used is of the alkyd type thinned with a petroleum distillate.

Other Applications

In addition to zinc yellow primers, many other chromate-containing paints are used for the protection of refinery equipment and structures. Practically all yellow paints are made from lead chromate; greens are mixtures of lead chromate with a blue pigment; oranges are made from basic lead chromate. Heat-resistant and weatherproof green pigments and roofing granules of the best quality are made by firing ceramic materials with chromic oxide.

Before painting, it is frequently advantageous to passivate metal surfaces with a chromic acid or bichromate dip; some treatments produce a protective chromate conversion film. Aluminums are chromic acid anodized for corrosion protection and to provide an adherent base for the zinc chromate primer; steel is given a hard chromium plate by electrodeposition from a chromic acid bath; leathers are chrome tanned, while clothing is kept from fading by chromium mordants—to mention but a few of the applications which are encountered at every turn. In these uses, it is interesting to note how often the introduction of a small amount of a chromium chemical serves to protect, strengthen, or prolong useful life, and thus eliminate waste.

In still another category are chromia and alumina catalysts for alkylation, oxidation, isomerization, hydrogenation, polymerization, and dehydrogenation of petroleum hydrocarbons and their derivatives, such as are used in rubber synthesis. These catalysts are prepared through thermal decomposition of chromium chemicals such as ammonium bichromate, chromic nitrate and chromic acid.

Physiological Effects of Bichromate

Occasionally dermatitis is incurred from contact with hexavalent chromium chemicals. Some authorities hold that light-complexioned individuals, or those with naturally sensitive skin, are more susceptible to this variety of skin irritation than others, but care should be exercised by all. From the point of view that prevention is better than cure, people working with bichromate, or its solutions, should not permit it to remain in contact with the skin; thorough washing with lukewarm water is the best means of removal. Work clothing next to the skin should be changed whenever there is question of contamination. Preferably gauntlet rubber gloves should be worn; and, in any event, cuts or other breaks in the skin should be protected.

Other possible effects of contact with bichromate include eye inflammation, nasal septum irritation, and ulceration of existing skin lesions. Accidental entry of bichromate into the eye should be treated as quickly as possible by flushing the eye copiously with clean water for at least 5 minutes, after which a physician should be consulted without delay. Failure to act quickly in flushing with water may add substantially to the degree of eye irritation.

Under no circumstances should bichromate be allowed to enter the nose. The possibility of nasal septum irritation is greatest where bichromate is in air suspension, and perforation of the nasal septum ultimately may occur if protective measures are not taken. A respirator is effective for this purpose.

Contact of bichromate with breaks in the skin may cause ulceration with onset of so-called "chrome sores"; under this condition, the danger of infection as a secondary effect is increased. Because physicians have infrequent occasion to treat bichromate ulceration, the following directions from an article by Albert R. Wilkerson, M.D., are quoted for their guidance:

"If the sore is small, wash thoroughly with 1-1,000 solution of bichloride of mercury, paint with mercurochrome, dry, and apply either unguentine or zinc oxide ointment, and dress. If no separation of the edges of the affected area from the surrounding good tissue has taken place in 48 hours, continue the above procedure but dust on thymol oxide powder before using the zinc oxide. Then apply the zinc oxide and dress; continue until the separation begins.

"If the sore is large and is accompanied by pain and swelling, apply a wet dressing of 1-2,000 solution of bichloride of mercury and continue until pain and swelling have subsided and separation begun.

"In either case, if partial separation has occurred, wash once more with 1-1,000 solution of bichloride of mercury, mercurochrome, and either unguentine or zinc oxide treatment as above.

"The tendency of the sore to heal over at the top is prevented by cutting away all proud flesh around the edges of the wound, which will cause the wound to heal from the bottom instead of from the top. Such cutting should be done by a competent physician; no attempt should be made to cut or tear away the dead slough from the living tissue as the resultant pain would be intense and infection invited. The raw bleeding surface will heal, but if the healing is slow it can be stimulated with thymol iodide. It is important to keep these sores covered until completely healed, and they should be dressed daily.

(Continued on page 98)

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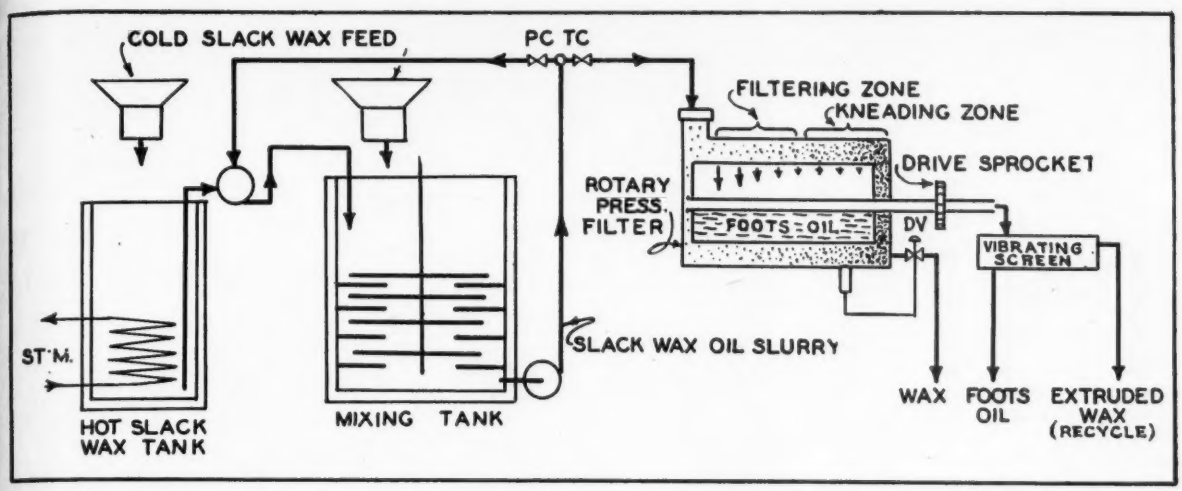

Fig. 1—Preparation of cold slack wax feed, and filtering of the slack wax-oil slurry are here shown schematically. Operation is continuous

New Mechanical Filter Replaces Slack Wax Sweating Operation

by George Weber

EXTREMELY high rates of wax separation from foots oil are obtained in a unique rotary pressure filter on which details were recently released by Tide Water Associated Oil Co. Designed and tested by the company's research and development department at Bayonne, N. J., the new device functions as a mechanical wax sweater, charging slack wax cake from conventional cold pressing of wax distillate.

At operating pressures ranging from 5 to 25 psi., capacities exceeding 50 gal. of charge per square foot of filter area per hour have been obtained in experimental work. The degree of wax-oil separation is such that one pass through the unit is equivalent to several sweatings, while recovering slightly more wax. The process may be used for melting-point separation as well as for initial expression of foots oil.

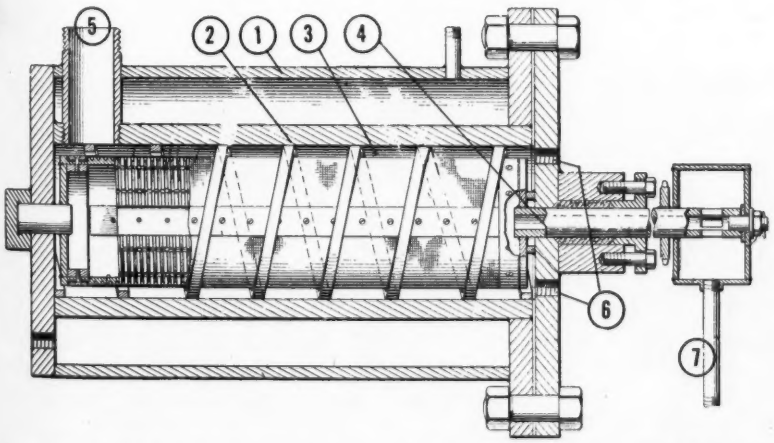

Fig. 2—This detailed drawing of the pressure filter shows the rotating filter element, or screened barrel which revolves inside the stationary cylinder lined with an internal spiral. Wax entering the unit moves in the annulus, to the right as foots oil is filtered out. Items are (1) temperature control jacket; (2) stationary cylinder with internal spiral; (3) rotating filter element; (4) hollow drive shaft; (5) slurry charge; (6) wax discharge, and (7) foots oil discharge

The wax pressure filter has the following inherent advantages over sweating:

1. Lower utility requirements.
2. Continuous operation.
3. Lower investment costs.
4. Less space requirements.
5. Less wax in process.

Early Studies

At the inception of the work on this development, a basic study was made of sweating operations. A review of this phase of wax manufacture revealed that there had been relatively no fundamental advance in the art since the turn of the century. While air conditioning of ovens, cam-controlled sweating cycles, and extended surface tubes have improved the process, it was still basically dependent on the expression of oil from sweater cake purely by gravity. In such gravity separation, cake drainage is resisted by 4 to 6 in. of wax cake. Cycles are time consuming and considerable heat interchange is required through a poor heat-transfer medium.

Requirements to be met in a mechanical wax sweater were established as follows:

1. Capacity in respect to wax-oil separation rate should be many times that obtained per square foot of conventional sweater cake drainage.
2. Equipment must be relatively inexpensive, with few moving parts and minimum utility requirement.
3. The proposed process should uti-

lize solidified press cake as discharged from the presses.

4. Process time should be short and effective.

These requirements made it apparent that a rapid method of heat transfer must be evolved, mechanical oil expression through pressure must be an integral part of the operation, and a filter medium which would successfully retain the wax with minimum resistance to oil flow, was indicated.

Preparation of Charge

Basic experiments began by selecting and studying the physical characteristics of representative samples of press cake. The work on preparation of these solid cakes in a slurry form suitable for pressure filtering evolved the method now adopted.

The wax cake is broken up, or comminuted, and at the same time the temperature is raised to a point providing most efficient separation of wax and oil from the resulting slurry. This step is accomplished as shown schematically in Fig. 1. Press plant cake as discharged directly from the conventional cold presses is fed continuously into a beater tank. While mixing with heated slack wax, it is comminuted by stirring and brought to the desired temperature. Temperature may be controlled by the amount of hot slack wax introduced to the mixer, by the jacket temperature of the mixer, or by recycle of foots oil from the filter. This treatment results in a rapid formation of a slurry comprising agglomerated wax particles floating in foots oil.

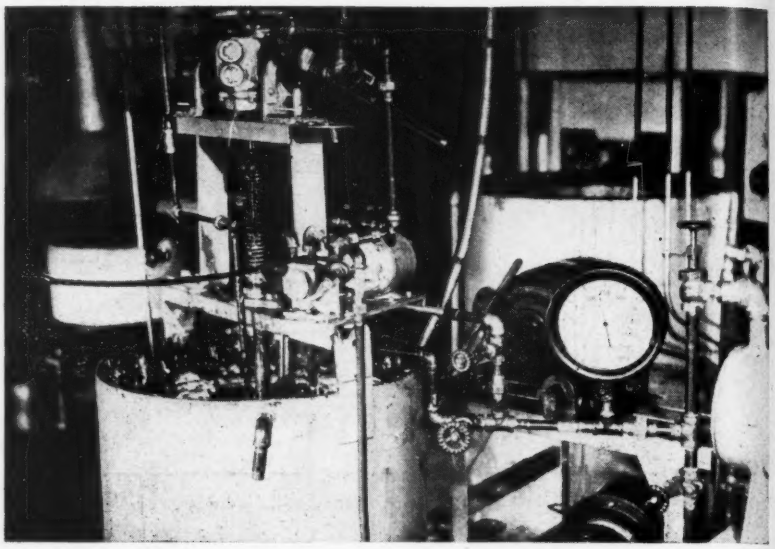

Fig. 3—Beater tank for preparation of wax-oil slurry charge

With development of the preparation cycle completed, the next step in the investigation consisted of devising a mechanical means productive of the results obtained when the comminuted wax slurry was enclosed in cotton cloth and gently kneaded while submerged in warm water.

From this work came the design illustrated in Fig. 2. The unit consists of a jacketed cylinder on whose interior surface is fixed a spiral element fabricated from square steel bar stock. This spiral is tack-welded firmly to the inner bore and the inner surface of the spiral is then bored precisely to parallinity with the working barrel.

The working barrel comprises a slotted cylinder closed at both ends and mounted on a hollow, perforated shaft. A detailed study was made of conventional filter mediums with which to cover the cylinder. Monel metal cloth, cotton duck, and glass fabrics were tested. A 30 by 150 Monel screen gave excellent results, with filter rates as high as 70 gal.

TABLE 1—WAX SEPARATION DATA, USING 0.003-IN. EDGE-TYPE FILTER

Run No.—	Plant slack wax charge, M.P. °F.	Charge temp. (°F.)	Filter pressure, psi.	Filter speed, r.p.m.	Rate, gal. charge per ft.²/hr.	Product yield % of charge			Product M.P. °F.		
						Scale wax	Foots oil	Wax extruded with oil	Scale wax	Foots oil cloud	Wax extruded with oil
S. W. 49	108.6	90	20	36	28.0	52.0	41.3	6.7	119.4	93	109.4
S. W. 50	110.0	91	4	36	38.2	50.6	45.3	4.1	120.6	92	112.7
S. W. 51	110.0	85	14	36	13.2	67.0	30.0	3.0	118.2	88	106.0
S. W. 52	109.2	90	5	36	47.3	49.1	45.1	5.8	120.0	93	111.2
S. W. 55	103.8	85	30	36	31.1	66.6	32.5	0.9	112.0	84	102.0
S. W. 58	104.0	82	10	36	53.6	60.1	38.1	1.8	111.3	84	109.1

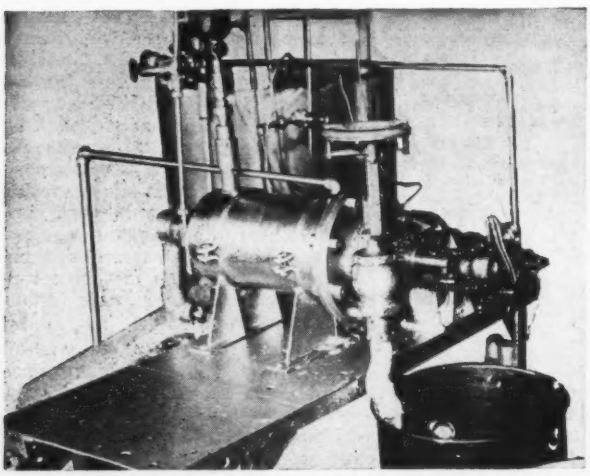

Fig. 4—Experimental filter unit, assembled and operating

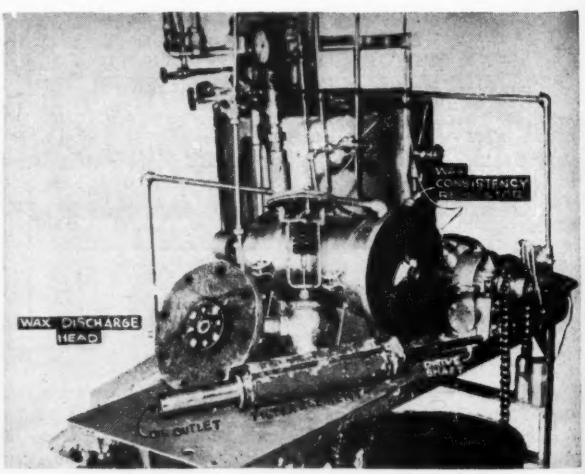

Fig. 5—Disassembled filter unit with integral parts identified

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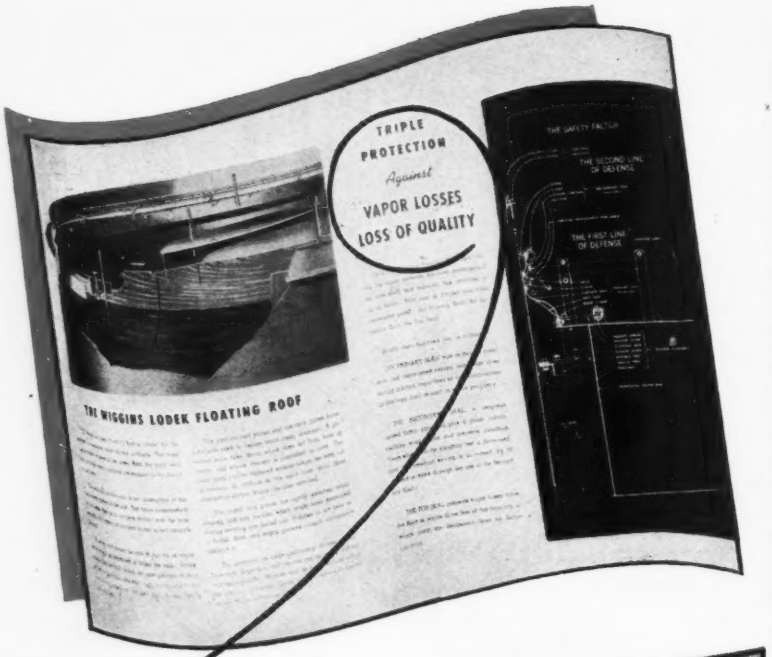

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Write for bulletin FR-3 which gives further details on Wiggins Lodek Floating Roofs.

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per sq. ft. per hour. However, as with the other filter mediums mentioned, it showed a declining filter rate due to plugging. Ultimately, it was discovered that the use of an edge-type filter medium resulted in a continuously high filter rate over long operating periods. The edge-type medium selected comprises a fine triangular cross-section wire, wound with the apex of the triangle inward. Thus the triangle bases form the filter surface, and flow through the filter is through fixed spaces between wire windings, providing a divergent passage which minimizes clogging.

Using a filter medium of this type, the working clearance between the outside surface of the wound working barrel and the inner surface of the spiral was found to be most effective between .01 and 0.1 in. This factor is significant inasmuch as this clearance determines the maximum thickness of wax through which oil must be forced and which, in part, accounts for the high filtration rates obtained at the low operating pressure.

As shown in the schematic flow chart (Fig. 1) under operating conditions the prepared slack wax slurry is pumped into the mechanical sweater where it fills the annular space between the outer surface of the filter element and the inner bore of the jacketed cylinder.

Filtration of foots oil is rapid near the charging end of the unit. Rotation of the filter element, plus the effect of the charging pressure, moves the separated wax longitudinally toward the discharge end. In passage, the wax is kneaded and mixed continually, bringing areas of the mass to close proximity with the filter surface. This provides efficient stripping of the remaining foots oil and results in the accumulation of a plastic, oil-free wax at the discharge ports leading to a common wax outlet line. It is necessary that a short plug or seal of wax be maintained in the discharge end of the system to prevent blow-by. This is provided by the installation of a small seal-regulating device in the discharge end of the cylinder. This device operates an air pilot valve which in turn actuates a diaphragm motor valve in the wax discharge line. Thus a floating plug of deoiled wax is maintained in the discharge end of the cylinder. It was determined that an estimated maximum variation of the wax plug or 1 in. above or below the regulator is obtained.

Foots oil expressed in the operation proceeds through the filter medium and flows by gravity through the perforated hollow shaft, to a vibrating screen. Due to the inherent characteristics of the edge-type filter, approximately 4 per cent of the wax content in the charge is generally extruded through the filter in rice-like particles. These are screened from the foots oil and recycled with the charge to the filter unit.

Some results obtained with the me-

chanical filter are shown in Table 1. Temperature of the charging slurry, pressure, and filter speed may be varied to obtain best optimum conditions for various slack waxes, and for production of certain product specifications.

Electrical Features of Portable Rig

(Continued from page 59)

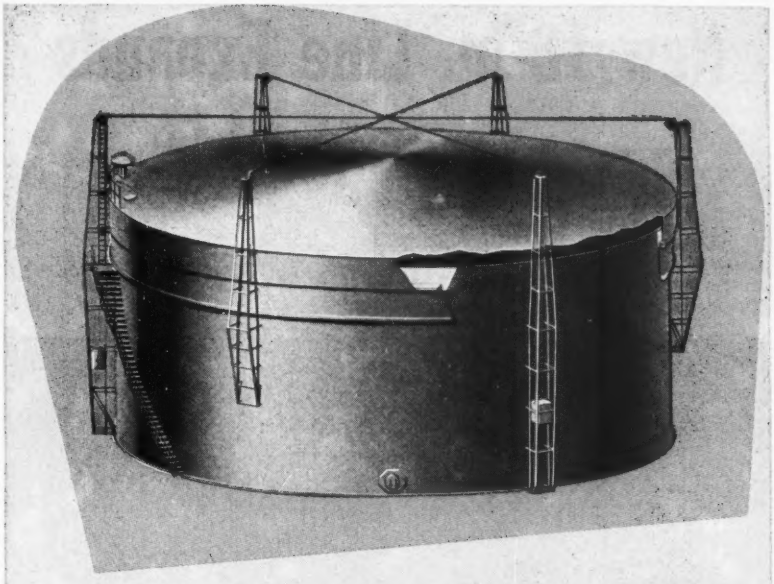
overloaded regardless of the load demand on the electric motors. This has been accomplished by using a generator field design which causes the voltage of the generator to droop as the current increases.

The peak generator kilowatt output does not exceed 110 per cent of the 200-kw. rating, although the maximum current output approximates 200 per cent. Thus, when it is necessary to exert a large pull on the traveling block, the draw-works motor will provide the necessary torque, but its speed will drop and the resulting horsepower output from the prime movers will not exceed the engine rating.

In addition to the exciter there is mounted on the main generator a 15-kw. auxiliary generator which provides power for operating blower motors and other auxiliary apparatus. This auxiliary generator is belt-driven from the main generator and it, in turn, is coupled to the exciter. The control circuits are so arranged that the auxiliary load—air compressors, shale shakers, blower motors, lights, etc.—is divided among the three auxiliary generators. Even though the main engines are running at idling speed, the auxiliary generators operate satisfactorily because they are provided with voltage regulators which insure constant voltage at any speed, from idling to full speed.

All of the electrical equipment on this rig is mounted on trailers, and the interconnecting leads are arranged for rapid connection and disconnection. Cables are made of flexible wire insulated with synthetic rubber. This arrangement means a reduction of the time when changing from one location to another.

The compactness and mobility of the trailer-mounted electrical equipment play an important part in saving time when changing locations, since the trailer-mounted generators, motors, and control can be hauled quickly into position and wired up. The cost of setting up goes down with this type of electric rig because there are fewer large, heavy units, and no elaborate mechanical equipment to install. The size of equipment often determines where rigs can be placed and how they can be used. The physical arrangement of the electrical equipment on this rig requires a minimum of space and provides a maximum of flexibility.



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New 16-In. Line Expands Edmonton Gas System

by Neil Williams

Above: The firing line — final welding of Northwestern's new 16-in. gas line to Edmonton. Left: Coating and wrapping of line. Traveling machine was followed with holiday detector (spiral wire ring at lower right) to locate any leaks in coating

NORTHWESTERN UTILITIES, LTD., recently has completed another 20-mile extension of a new 16-in. pipe line it is laying to augment its present gas-transmission system from Viking-Kinsella field to Edmonton, Alta., Canada. Started in 1945, the line has been laid in short loops each year as load demands on the system have increased. It now extends a distance of approximately 64 miles from the field end, leaving only about 16 miles of pipe yet to be laid at the Edmonton end to complete it the entire distance of 80 miles. Plans call for laying the final section next summer.

The system now has two complete paralleling lines, which, with the 16-in. looping completed to date, is designed for peak loads of 88,000,000 cu. ft. of gas daily. The original line, laid in 1923, consists of 36 miles of 10¾-in. (o.d.) and 44 miles of 12-in. pipe. The second line has 12¾-in. pipe the entire distance. It was started in 1929, and, as in the case of the new 16-in. line, was laid in stages in the form of loops, the final section being completed in 1943.

All three lines are manifolded together every 10 miles, forming an integral system. This is done so that in the event of a break in a line, or for other reasons, no more than a 10-mile section of any line need be out of service at any time. By means of the valves at the manifolds, the gas in any line can be diverted to either or both of the other two lines around the isolated section.

The original line was laid bare in 20-ft. lengths with Dresser couplings. The second line was laid in 100-ft. welded lengths which are joined with Dresser couplings. Approximately one-half of the latter line, comprising the earlier sections that were laid, is bare. The remainder is coated with Barrett enamel and wrapped with asbestos. The new 16-in. line is acetylene-welded its entire length, and with the exception of about 12 miles is coated with enamel and wrapped with asbestos.

Seamless, ⅜-in.-wall, extra-heavy, English-made pipe was used for the latest 16-in. section. The wall thickness and weight were more than was needed, but this pipe was all that was available at the time. The first shipment was unloaded at the east coast and the remainder at Vancouver and shipped by railroad to convenient points along the right-of-way. The pipe was received in 35-ft. lengths, which were "stovepipe" welded into the line. Weight of the pipe necessitated the use of heavy counterweights on the sides of the tractors opposite the lifting booms.

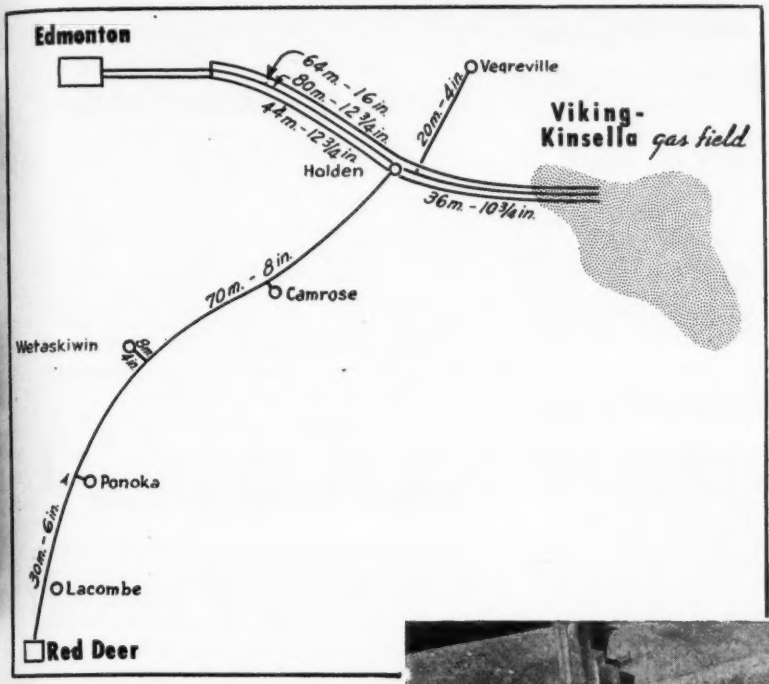
Cleaning and priming, and coating and wrapping were done with Perrault traveling machines on the line following the tack-welding and firing-line crews. A minimum coating thickness of 3/32 in. was desired. Due to a wavy and irregular exterior pipe surface it was necessary to apply enough additional coating material to obtain at least a 5/32-in. normal thickness.

The coating and wrapping machine was followed with a spiral ring-type holiday detector, and any leaks found were hand-coated to insure a perfect job.

Terrain through which the right-of-way passes is rolling and necessitated many bends to shape the pipe over the rises. Bends involving angles over 10° were shop-fabricated but all others were made with the pipe on the line. For the latter, heat was applied with torches at the bending point. Weight of the pipe plus that of several men sitting on the far end of the joint was sufficient to make the bends. During the operation, a tractor boom supported the end of the pipe to prevent excessive bending.

Ditch for the line was machine-dug to a depth of approximately 64 in., providing a 48-in. covering for the pipe. Surface formations consist of alluvial soil depositions, and being relatively high and dry, no difficult conditions were encountered. The right-of-way parallels a highway and the railroad most of the way so that all work was readily accessible.

The company maintains its own pipe-line crews and equipment with which all of its lines have been laid.



area of approximately 300,000 acres with a dry-gas reserve variously estimated at from 700 to 800 billion cubic feet in an Upper Cretaceous sand at depths of 2,100 to 2,200 ft. In it, Northwestern Utilities, Ltd., owns 100,000 acres in two solid blocks. Remaining proved acreage, except for one tract held by H. B. Oil & Gas, Ltd., is owned by Imperial Oil, Ltd.

Currently, 55 wells are tied into Northwestern's gathering system. These include 49 owned by Northwestern, 5 by Imperial, and 1 by H. B. Oil & Gas. Thirteen additional gas wells have been completed by Imperial but these are located at remote scattered locations and are shut in. H. B. Oil & Gas also has completed one additional gas well which has been shut in. So far as Northwestern is concerned, development of its properties has been confined to drilling additional wells only as needed to meet its increasing demand for gas. Three wells were added the past year, and five each during 1947 and 1946.

Above: Northwestern Utilities gas-transmission system. Right: Three main lines are manifolded together at 10-mile intervals. Picture shows one of these manifolds before erection of housing

On a construction project it sets up a semipermanent camp with modern conveniences and operates its own kitchen and mess hall. With the exception of emergency work, all projects are planned so that they can be done during the summer or early autumn months.

From the Edmonton system, with inlet end at a point near Holden about 28 miles west of Viking field, the company has a 100-mile line extending southwestward through Camrose, Ponoka, and Lacombe to Red Deer. This line, laid in 1946, consists of 70 miles (to Ponoka) of 8-in. and 30 miles of 6-in. seamless, 3/16-in.-wall pipe. It has a 4-in. branch extending from about its mid-point to Wetaskiwin, a distance of about 8 miles. Another line, with inlet end at a point 22 miles west of the field and consisting of about 20 miles of 4-in. lapweld pipe, extends from the Edmonton system northeastward to Vegreville. Both lines are all welded, coated, and wrapped.

So far no compressor stations have been needed for the system. Wellhead pressures in Viking-Kinsella field are still above 600 psi., which leaves sufficient margin to maintain a main-line inlet pressure of 400 psi. direct from the field gathering system. With this inlet pressure, the pressure at the Edmonton terminus regulator station can be held at approximately 300 psi.

Viking-Kinsella field embraces an

Making hot bend on Northwestern 16-in. gas line. Heat is applied with torches at bending point (foreground) while two men at end of joint add their weight to that of the pipe to shape the line over the rise

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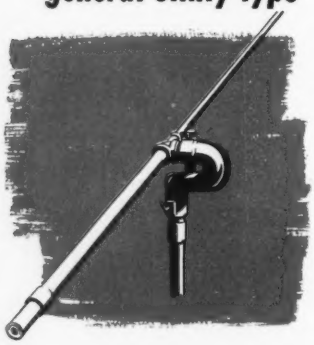

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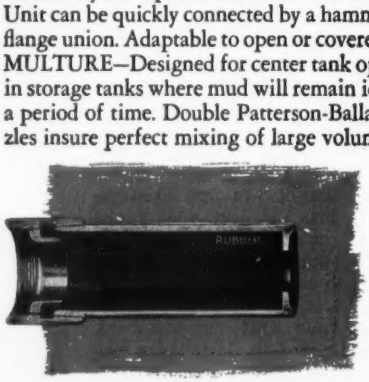

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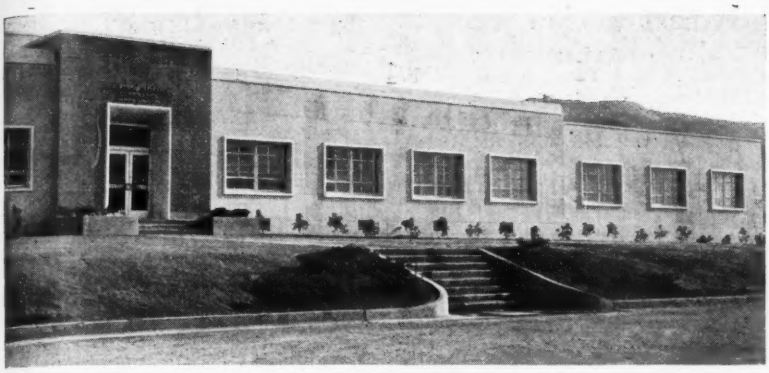


Partial view of new California $1,000,000 exploration-production laboratory

California Research Corp. Opens Oil-Field Laboratory

by Herndon David

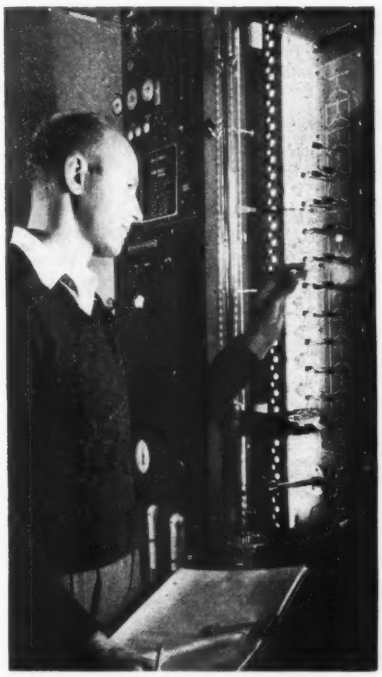
STANDARD OIL CO. of California, through its subsidiary, California Research Corp., has opened officially a modern oil-field research laboratory at La Habra, Calif. The new facilities, built at a cost of more than $1,000,000, are designed to implement a comprehensive oil-exploration and production-research program. The new laboratory, one of three now operated by California Research, is situated literally in the shadows of the oil derricks of Murphy-Coyote oil field.

The La Habra laboratory is a one-story reinforced-concrete structure with full basement. The building houses 20 offices, 13 laboratories, each with its own adjoining laboratory office, a conference room and a library. A complete instrument shop, an electronics shop, locker rooms and storage space, together with mechanical equipment for servicing the building, are located in the basement. The structure is completely air conditioned and employs fluorescent lighting throughout. All laboratory and office furniture is of modern steel construction.

The research staff, now numbering more than 80, has as its goal the development of new and improved methods of finding accumulations of oil and gas and increasing the economic recovery from known accumulations through improved production practices. To attain this goal the activities of the laboratory are grouped into four separate classifications: exploration, drilling, production, and surface processing.

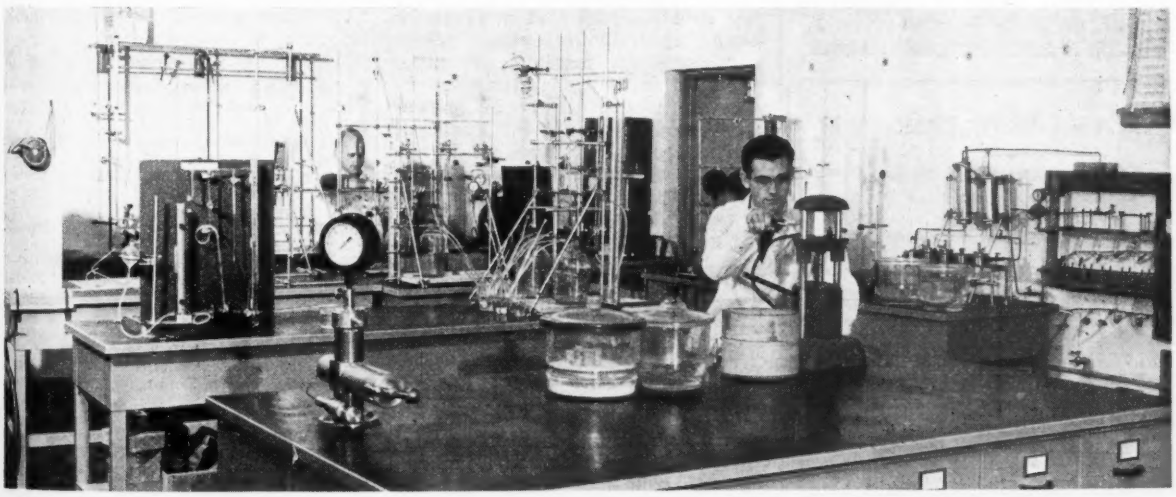
Exploration

Exploration research has as its broad aim the development of new or improved methods for finding additional reserves of oil and gas. The major sciences involved are geology and geophysics, but the complexity of the problems requires the applica-



Analysis of oil and gas samples for their lighter hydrocarbon constituents—this unit is a low-temperature fractionation column which operates at temperatures as low as 100° to 200° below zero. The operator shown is Herman Dykstra

In this room at the La Habra laboratory, problems related to the flow of fluids in underground strata are studied



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GAYLORD HEADS RESEARCH

E. G. Gaylord, vice president of California Research Corp., is head of the oil field research division. A graduate of University of California, Gaylord has been connected with oil production for more than 35 years. He served as chief petroleum engineer with Standard's producing department

E. G. GAYLORD

R. F. FAULL

prior to his appointment with California Research Corp.

R. F. Faull is manager of the La Habra laboratory. He is a graduate of University of California, holding B.S. and Ph.D. degrees as well as Phi Beta Kappa honors. He has been with Standard's research organization since 1937.

tion also of mathematics, physics, and chemistry. The La Habra laboratory is staffed and equipped to carry out exploration-research projects involving all of these sciences.

In connection with the exploration research, it is interesting to note that the staff has as its ultimate aim the development of a method of direct oil location rather than the location of structures favorable for the accumulation of oil. (Although methods of direct oil location have been claimed at various times, none of the methods has proved successful.)

Drilling

The general objective of drilling research is the development of new or improved methods and equipment for drilling oil and gas wells. At the same time it is essential that methods for completing wells be evolved which will assure the maximum potential output when the underground reservoirs are tapped. Active drilling-research projects include the studies of drilling fluids, techniques for identifying the nature of formations being drilled, development of instruments for observing and controlling the progress of drilling, and determination of best methods of completing wells under different conditions.

Even specialized problems falling under one of the more general classifications are carefully studied.

Production

Production research is directed toward increasing the economic recovery of oil and gas through improving both primary and secondary-recovery practices. Two very important fundamental problems are the determination of physical behavior of oil and gas at conditions of pressure and temperature existing in the underground reservoirs, and derivation of an exact understanding of the way in which oil, gas, and water move through the reservoir rocks.

Emulsion and corrosion studies form an important part of the production-research work. Microscopic studies of all types of corrosion are made with methods of elimination as the ultimate goal. Also, the most economical and efficient method of breaking emulsions receive careful attention and study.

Surface Processing

Surface processing research, as the name implies, is concerned with oil and gas after they have reached the surface, but before they have left the oil field. Goal is the development of the more efficient methods for recovering natural gasoline, liquefied petroleum gases, and condensate from well-head gas.

Corrosion Inhibition

(Continued from page 87)

"With a few people bichromate in the nasal passages will cause irritation and eventual perforation of the nasal septum. It has been found that such conditions respond to spraying not oftener than once a day with mercurochrome, or by application of a salve of the following composition:

Boric acid	60 grains
Menthol	10 grains
White vaseline	480 grains

"Under no circumstances should tincture of iodine be used to treat bichromate sores on the skin or bichromate irritations of the nose."

However, where possible contact is limited to occasional handling of small quantities or dilute solutions of bichromate, as in corrosion control, reasonable care and sanitation are sufficient to prevent disagreeable reaction in nearly all cases. No newly discovered hazard has prompted the inclusion of these precautions, but rather a desire to promote the general welfare of the users of chromium chemicals.

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8. Tarr, O. F., et al, Ind. Eng. Chem., 33, 1575 (1941).

Dr. James W. McBain, professor of chemistry at Stanford University, lectures Humble Oil & Refining Co. technical personnel in one of that company's "Lectures in Science." Humble "students" in the picture are C. H. Stevenson, Charles T. Jones, Charles L. Thorpe, Morris R. Morrow, Ralph J. Schmidl, Jimmie C. Schiller, and Dr. B. F. Armendt

Humble Has Unique Program for Advanced Scientific Education

by Leigh S. McCaslin, Jr.

THE third series of Humble Oil & Refining Co.'s unique "Lectures in Science" program is now under way at the company's Baytown, Tex., refinery. This program is designed primarily to bring advanced scientific training to research and technical personnel. Outstanding scientists from American universities are invited to Baytown to conduct the unusual 2-week courses.

The Lectures in Science program enables Humble technicians to obtain advanced scientific training without long periods of graduate study away from their jobs. Vocational subjects are purposely avoided with emphasis placed on courses covering basic chemical and engineering subjects. Courses range from 1 to 4 weeks' duration and occupy the full time of the "students."

First lecturer in the current 1948-49 series was Dr. R. L. Pigford, chairman of the chemical engineering department, University of Delaware, whose subject was "Mathematics of Chemistry and Chemical Engineering." He was followed by Dr. James W. McBain, professor of chemistry at Stanford University covering "Emulsions."

Visiting scientists and their subjects for the remainder of this year's series are: Dr. B. F. Dodge, professor of chemical engineering, Yale University, "Chemical Engineering Thermoydynamics"; Dr. Henry Eyring, dean of the graduate school and professor of chemistry, University of Utah, "Kinetics"; Dr. Paul D. Bartlett, professor of organic chemistry, Harvard, "Theoretical Organic Chemistry"; and Dr. F. A. Matsen, professor of chemistry and physics, University of Texas, "Physical Chemistry."

The number of technical and research people attending the lectures is limited. Selection is based upon the interest of the individual and his need for the material being presented in so far as his company job is concerned. An upper limit of 16 has been placed on the size of a class. Attendance is considered a part of the regular duties of those attending and they are excused from all company assignments for the duration of the course. Dr. J. L. Franklin, research associate, heads the program for Humble.

To permit free interchange of ideas, professors giving the lectures agree not to disclose any technical information gained at Baytown. This agreement applies to those lecturers who do not have conflicting commitments such as consulting jobs with other oil companies. It is not altogether an academic procedure, as the professors gain current knowledge of industry's problems. Humble officials believe that this knowledge puts them in a better position to shape their college courses to the needs of industry.

Most of the lectures presented are on a postdoctorate level. However, one or two courses each year are conducted at graduate level for those who have not had the benefit of formal graduate training. Courses of this nature are in physical chemistry, organic chemistry and chemical engineering.

After 2 years of trial during which 17 courses have been presented, the program has been described by company officials as "most successful." At the close of the first series, a questionnaire was circulated by management among those participating. The results indicated an enthusiastic acceptance of the lectures and a general desire that they be continued. In fact, more than 80 per cent of those polled indicated a desire to participate in future courses.

U. S., Canada, and U. K. Unify Thread Standards

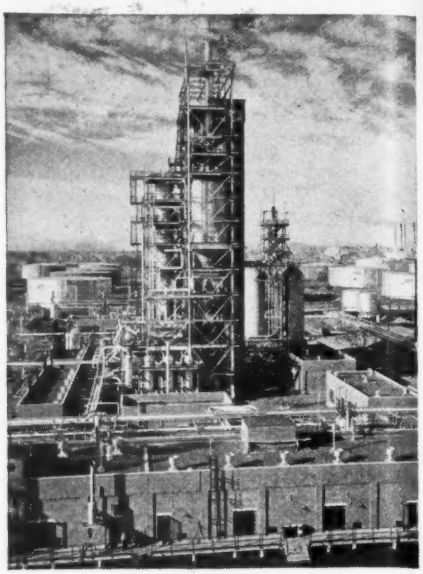
Representatives of Canada, the United Kingdom, and the United States have signed an accord which has been 30 years in the making, providing for unification of the American and British standard systems of screw threads.

The accord will make possible for the first time the interchangeability of American and British screw-thread parts, and represents a compromise between the two systems.

The British system, originated in 1845, is based on a thread angle of 55° with a thread form having rounded crests and roots. The American system, developed in 1864, has a thread angle of 60° with a thread form having flat crests and roots. The unification agreement provides for the American angle of 60° and the British rounded root, leaving the crest of the thread flat or rounded, as preferred by the manufacturer. Equally important, the number of threads per inch for the various diameters has been unified.

NUMBER 7 IN A SERIES

The important question in foreign refinery construction is "Which Master Contractor?"



GREAT pressure for refinery expansion and refinery modernization is now being felt in foreign fields, where both a ten year hiatus in building and major war destruction must be overcome. The new capacity required is large and presents serious capital outlay problems to both foreign national refiners and foreign subsidiaries of American companies.

The *master* contract type of operation, concentrating all engineering, material procurement and construction responsibility at any one refinery site in one organization's hands, is especially desirable in this work because of the inherent potential for major capital savings which has been established previously in this series.

Thus, the question facing refiners undertaking projects for installation outside the United States becomes not *whether* to use the *master* contract type of operation but, rather, *which* "master" contractor to engage. To clarify consideration of this latter question, Kellogg presents what it believes to be the most important factors which should be taken into account when selecting a *master* contractor for foreign work.

First, it would appear most important to select an engineer-contractor that has had repeated experience with the multitudinous responsibilities of varied types of *master* contract operations and naturally a successful record.

Further, the contractor's *existing* establishment, in manpower and resources, should be capable of handling the entire project both expeditiously and efficiently *within his own organization.*

Second, this contractor should have had experience in *foreign* operations—not necessarily at the particular location of the proposed job, but most assuredly at a sufficient number of foreign locations so that the contractor's organization shall have learned *previously* the many unusual, and in many respects more difficult, requirements of foreign operation.

Third, the contractor's design groups—laboratory, process and mechanical—should have a *secure and unquestioned engineering reputation,* eliminating any desire or need to build "monuments to advanced processing" for prestige purposes, when such refinements are not justified by immediate and specific economic need. In short, the contractor's engineers should be mentally conditioned to approach the planning of each project on one basis only—*to design facilities which will meet the immediate and foreseeable market demands and in so doing earn the most pesos, cruzeiros, dinars, pounds, or francs over a period of years for the least immediate capital outlay.*

Fourth, under present world supply conditions, the contractor's ability to perform effectively the complex and difficult *task of procurement* of materials and equipment will prove critical in accelerating the on-stream date of the plant. Maximum speed and final economy in the conduct of this responsibility requires three basic capabilities: An existing procurement group *large* enough and *experienced* enough to purchase, inspect and expedite with thoroughness and dispatch the thousands of items of material and equipment which comprise a major refinery project; an *up-to-the-minute detailed knowledge of world-wide sources of supply,* which can be maintained only through active purchasing activity carried on constantly over the years in the major markets of the world; together with the "know-how" to utilize local currencies to the utmost in the procurement phase.

Fifth, the contractor must be capable of putting into the field when construction begins, *a quality of field supervisory and technical personnel equal to the magnitude of the task* . . . men accustomed to handling large-scale field administrative problems equivalent to those of a small city . . . men equipped by education, training and experience to solve problems in the field without need for reference to home office rulings and engineering advice.

Experience is the basis for this evaluation of the major considerations to be resolved by any refiner undertaking refinery construction outside the United States. _Experience_ that has paralleled the growth of the refining industry, extended over a period of some thirty years, and embraced refinery projects of all kinds in practically every corner of the globe. It is _experience_ that is further substantiated by foreign contracts currently entrusted to Kellogg totalling more than a hundred million dollars embracing _21 separate projects in Argentina, Belgium, Brazil, Canada, France, the Middle East, the United Kingdom and Venezuela._

BENNETT ARCHAMBAULT
Treasurer
In Charge of Foreign Contracts
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Cost-imating

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

Tower Insulation and Platforms

COST INDEXES 1946 = 100

	Refinery Construction*		
	M & L	M	L
1924	78	87	60
1925	73	80	58
1928	72	78	57
1929	71	76	59
1930	65	68	57
1931	61	63	57
1932	56	60	48
1933	57	61	49
1934	59	62	55
1935	62	64	58
1936	64	66	60
1937	69	71	65
1938	67	67	67
1939	69	68	68
1940	70	70	69
1941	75	77	71
1942	80	80	79
1943	85	85	87
1944	86	85	90
1945	90	88	94
1946	**100**	**100**	**100**
1947	117	115	119
1948 est.	151	149	154

*Cost-imating No. 1, October 21, 1948, page 141.

Magnesia insulation is used almost exclusively for the insulation of towers and vessels in the petroleum industry although mineral wool[1] and other cheaper insulations would seem to be useful. The amount of insulation thought to be necessary varies with contractors, but the following may be used as a guide:

Internal temperature (°F.)	Thickness (in.)
200	1½
400	2
600	2½
800	3
1,000	3½
1,200	4

Ladders (three slats) not including supports, weigh about 18[3] lb. per ft. of length and with supports 30[5]-50[6] lb. per ft. According to Fowler and Brown[5] the weights of tower platforms with handrails are about 500 lb. plus 300 times diameter, or:

Diameter	Lb.	Dia. (ft.)	Lb.
2 ft. 6 in.	1,250	7	2,750
3 ft.	1,400	8	3,000
4 ft.	1,750	9	3,250
5 ft.	2,150	10	3,500
6 ft.	2,450	11	3,700

The cost of these items is not great and hence the values of Table 3 based on a 1946 steel price of 15 cents per pound installed may be used.

TABLE 1—COSTS OF MAGNESIA BLOCK INSULATION—1946
(Dollars per square foot)

Thickness (in.)	Material[2,3,4]	Labor[2,*] Below 15 ft.	15-25 ft.	Above 25 ft.
½	.14-.20	....	....	....
1	.16-.24	.96	1.11	1.28
1½	.24-.36	1.01	1.16	1.39
2	.33-.45	1.05	1.21	1.44
2¼	.37-.48	....	....	....
2½	.40-.52	....	....	....
2¾	.46-.53	....	....	....
3	.50-.55	....	....	....
3¼	.54-.59	....	....	....
3½	.58-.63	....	....	....
4	.60-.65	....	....	....
5	.67-.71	....	....	....

*Including hauling, scaffolding, waste, wire, ½-in. cement and labor at $2.75 per hour but no asphalt covering. Converted from 1947 by a factor of 1.19.

TABLE 2—AREAS OF INSULATION FOR TOWERS OR VESSELS

Diameter (ft.)	Square feet insulation: Per foot shell	2 heads
2	6	7
3	9	17
4	13	28
5	16	43
6	19	62
7	22	85
8	25	111
9	28	140
10	31	173
11	34	211
12	38	249
13	41	292
14	44	339
15	47	390
16	50	440
18	56	560
20	63	692
22	69	834
24	75	997
28	88	1,350
32	100	1,750

TABLE 3—TOWER PLATFORMS AND LADDERS, 1946

Steel, structural, ct. per lb.	15
Ladder, complete, per ft.	$4-$8
Platform:	
3-in. diameter	$210
5-in. diameter	$320
7-in. diameter	$410
10-in. diameter	$520
13-in. diameter	$650

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4. Bliss, H., Data for Cost Estimates, Chem. Eng., May 1947, p. 126.
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6. Happel, Aries and Borns, Chem. Eng., Dec. 1946.

No. 13 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa

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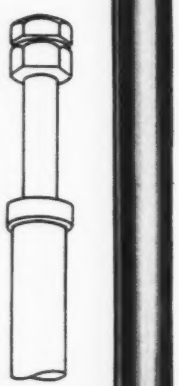
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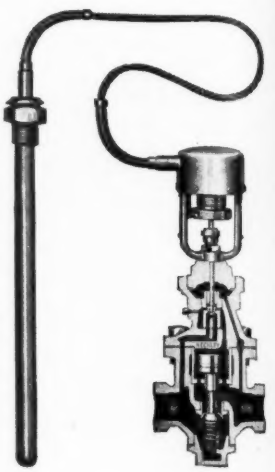
Regulator can be easily adjusted for any temperature within its range by turning wheel under the regulator head.

Bulb is made of copper and its fittings of brass, with brass armor over the flexible copper tubing.



The armored tubing is regularly furnished 8 ft. long; longer lengths when specified.

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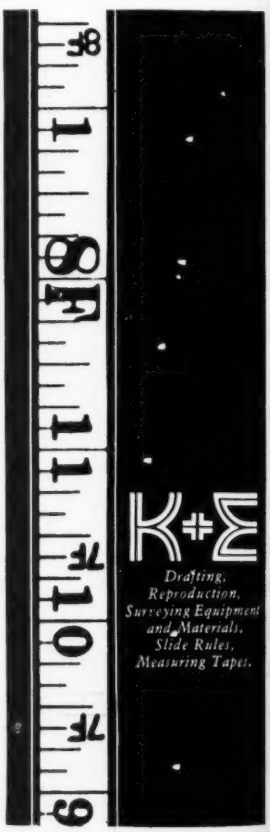

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ENGINEERING *fundamentals*

Total Gas Volumes for Gas Drive

(Continued)

IN the previous discussion the development of an expression for total gas volumes was reviewed. It can be carried further to yield other interesting and possible correlations.

The expression for the total cumulative produced gas volume V as related to the reservoir oil saturation, S_o, was given, for the assumptions of (1) constant pressure, (2) negligible gas in solution, and (3) the applicability of the semi-logarithmic relation between k_g/k_o and S_o, as follows:

$$V = \frac{\mu_o}{\mu_g}\,\frac{a}{vb}\,[(e^{-bS_o})_t - (e^{-bS_o})_o] \quad (1)$$

Using the relationship $k_g/k_o = ae^{-bS_o}$ in this equation, it becomes:

$$V = \frac{\mu_o}{\mu_g\, vb}\,[(k_g/k_o)_t - (k_g/k_o)_o] \quad (2)$$

which equation states that the total gas volume plotted versus k_g/k_o will be a straight line. This correlation, although simply another form of the first equation, would be useful for some type predictions.

Now if the gas-oil ratio equation be resubstituted into Equation 2 the following relationship is obtained:

$$V = \frac{1}{b\beta}\,(R_t - R_o) \quad (3)$$

or

$$R_t = R_o + b\beta\, V$$

where R_o is the producing gas-oil ratio at zero time and R_t is the same at time t. This is a useful correlation between the producing gas-oil ratio, R, and total gas volume produced. As with relationships formerly outlined, the slope of the plot is $b\beta$. A knowledge of both b and β and original value of R immediately allows a plotting of the expected trend between V and R_t. To obtain the proper dimensions of b, V must be total gas produced per unit of pore volume involved.

To demonstrate the apparent validity of Equation 3, data are again from "Secondary Recovery in the United States" (page 227), for that period after decline sets in and from Supplement 2, "Secondary Recovery in the United States" (pages 183-188), for the injection period July 1941 to July 1945 over which period operating conditions were fairly consistent. These data are plotted in the two accompanying graphs, both of which show a linear trend. The value of $b\beta$ in correct units cannot be calculated because the pore volumes involved are not known.

It should be pointed out that all the equations developed to give correlations based on the k_g/k_o concept are reservoir equations. When operating conditions (i.e., number of wells, packer settings, control equipment, etc.) are changed, such changes are reflected by an apparent break in the correlation sought. Data must be reviewed rather critically, therefore, before they can be fitted to a particular type correlation. For example, referring to Fig. 2, the plot beyond the point drops off definitely below the linear trend. However, an examination of the data given in the reference shows that at this point a packer setting was changed in one of the injection wells thus in effect giving gas drive through a different set of channels and a lowering of gas-oil ratio because bypassing had been eliminated mechanically, not because of a change in reservoir mechanism.

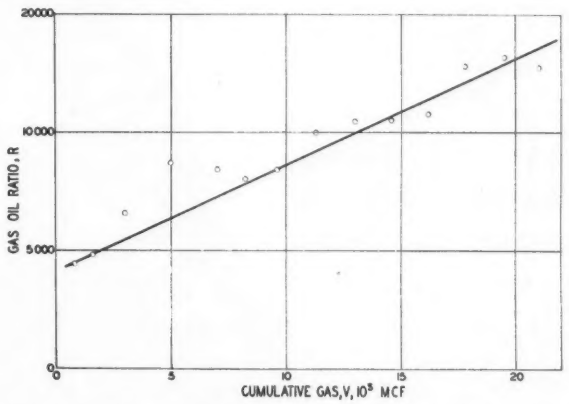

Fig. 2—Correlation according to Equation 3. (Supplement 2, "Secondary Recovery in the U. S.," pp. 183-188)

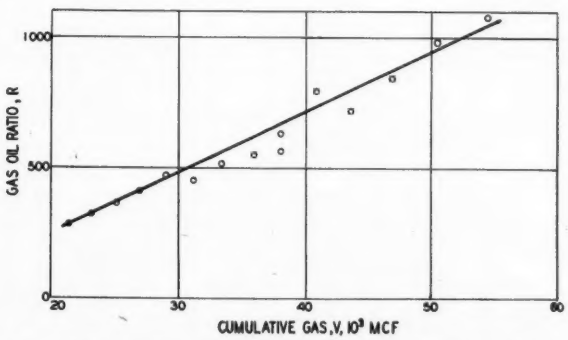

Fig. 1—Correlation according to Equation 3. ("Secondary Recovery in the U. S.," page 227)

Series by Dr. John C. Calhoun, Jr., Chairman, Petroleum Engineering School, University of Oklahoma

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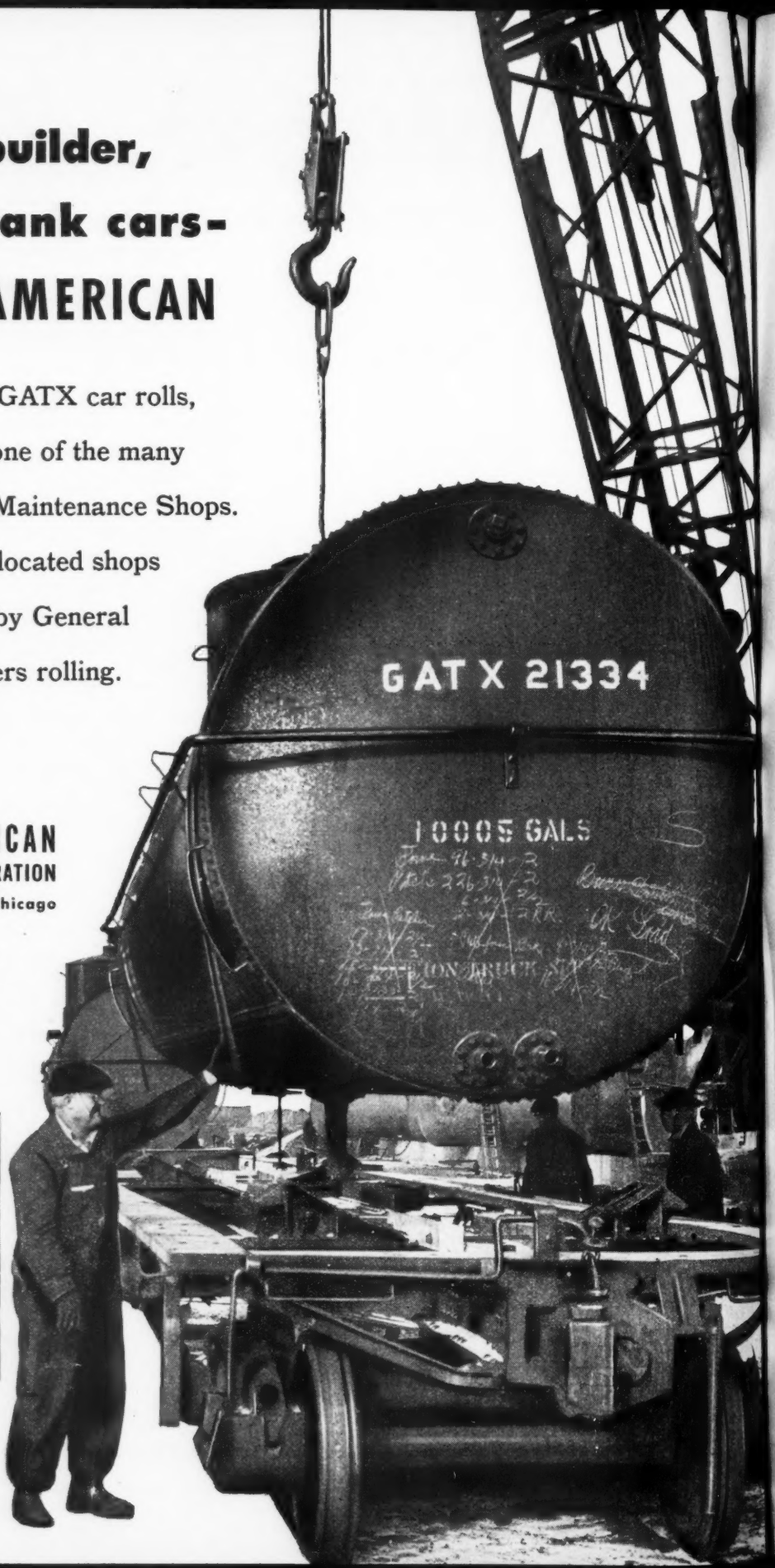

NATURAL GAS

Changes in Tennessee Gas Rate Schedule Suspended

Rate schedule changes proposed by Tennessee Gas Transmission Co. covering deliveries of natural gas to several of its customers, has been suspended by the Federal Power Commission. A hearing concerning the "lawfulness" of the proposed revisions has been scheduled by FPC to commence January 31.

The changes proposed by the company would, in effect, put specific volumetric ceilings on Tennessee's obligations to supply its "entire requirement" customers, and would change the quality provision to provide that the quality of gas is to be determined at the temperatures and pressures in Tennessee's pipe lines.

An objection to the quality provision change was received from Hope Natural Gas Co. of Clarksburg, W. Va., in a letter to FPC and the commission ordered the hearing concerning quality provisions to begin at 10 a.m., January 31. Objections to the volumetric obligation changes were received from East Tennessee Natural Gas Co. and Tennessee Natural Gas Lines, Inc., both of Chattanooga, Tenn., and both customers of Tennessee Gas. FPC ordered the hearing regarding these objections to commence at 2 p.m., January 31.

Lyle Moves to Free Natural Gas Producers From Control

Rep. John E. Lyle, Texas, has introduced to the House of Representatives legislation which would free producers of natural gas not transported across state lines from Federal Power Commission control.

The bill which has been referred to the House interstate and foreign commerce committee is a highly simplified version of the Rizley-Moore bill which was never passed by the Eightieth Congress.

Natural-Gas Sales Gain Continues in November

An American Gas Association report shows that natural-gas sales by utilities to ultimate consumers in November 1948 were 17.9 per cent over the comparable month of 1947, to total of 2,463,358,000 therms while mixed-gas sales showed a decline of 16.1 per cent to total 91,704,000 therms.

During the same month manufactured-gas sales registered a gain of 0.9 per cent for a total of 191,544,000 therms. Total sale of all gas by utilities to consumers was 2,746,606,000 therms, a gain of 15 per cent over November 1947.

For the 12 months ended November 30, 1948, total sales of gas amounted to 32,070,526,000 therms, an increase of 10.5 per cent over the same period a year earlier. Natural-gas sales during the year ended November 30, 1948, showed a gain of 12.8 per cent over the same period a year earlier, with a total of 28,354,795,000 therms compared to 25,135,551,000 therms for the year ended November 30, 1947.

Five Chosen for Graduate Study in Gas Technology

Five new men are pursuing graduate studies in the fall term at the Institute of Gas Technology. They include Bertrand R. Bertrando, chemistry graduate of the University of Illinois; Ray E. Cooley, chemistry graduate of Texas Tech; Clyde D. Hinman, chemical-engineering graduate of Kansas State College; John C. Pace, chemical-engineering graduate of Texas Tech; and William T. Turner, chemical-engineering graduate of Louisiana Polytechnic Institute.

At midterm, this group will be joined by Paul A. Fedde, now attending the University of Colorado and Sinesio A. Zagnoli, chemical-engineering graduate of Purdue University.

In order to provide the gas industry with young men specially trained in its technology, the Institute of Gas Technology annually awards a number of fellowships to selected college graduates to pursue a 2-year course leading to the master's degree in gas technology or a 4-year course leading to the degree of doctor of philosophy.

The following fellows are completing their requirements for the degree of master of gas technology this year: Robert W. Brooks, John R. Brough, Frank H. Coley, Rex T. Ellington, Jr., Don E. Helbling, and Henry C. Owen, Jr.

Fellows are selected from senior students and graduates in chemical engineering, chemistry, mechanical engineering, and related fields on the basis of academic and personal qualifications. They receive a graduated stipend beginning at $125 per month for the first year, in addition to free tuition and payment of laboratory fees. Cooperating member companies pay the fellows for work performed during the requisite summer employment training period.

Application forms may be obtained from the department chairman of the applicants college or from the Director of the Institute of Gas Technology, Technology Center, Chicago.

Natural Gasoline

Ring and Gill Have Option On Lockhart Properties

HOUSTON. — David Ring, independent oil operator, and Stanley Gill, petroleum engineer, both of Houston, have put up $500,000 option money for the purchase of oil and gas properties of L. M. Lockhart in Agua Dulce field, Nueces County.

Price of the properties will be $6,000,000 when the sale is completed. More than 13,000 acres are involved in the deal, including 9,000 proven acres. There are 81 oil and gas wells and 2,000 bbl. daily of oil production involved.

A cycling plant with a rated capacity of 60,000 M.c.f. of gas daily and producing around 20,000 gallons of products, is also on the property. The field is located about 30 miles west of Corpus Christi.

Ring and Gill have been with Lockhart as "observers" since September. When the deal is completed they will operate as the Gillring Oil Co. with offices in the Gulf Bldg., Houston. Lockhart, it is understood, will retain an override.

New Reading Plant Uses Butane to Produce Fuel Gas

A new plant to produce fuel gas has been put into operation by Consumers Gas Co. at Reading, Pa. This installation, the second catalytic cracking plant for the production of fuel gas to be installed in the United States, at present employs butane as a feedstock and has a capacity of 5,000,000 cu. ft. per day of coke-oven, gas substitute.

The plant is similar to that built for peak load shaving at the Riverhead station of Long Island Lighting Co. early in 1948. The end product of the process, however, is different, being a coke-oven-gas substitute rather than the water-gas substitute produced at Long Island.

Gas produced at the Reading installation has a heating value of 520 B.t.u. per cubic foot, and a specific gravity of 0.52°. The plant uses No. 3 fuel oil for heating the catalytic cracking furnaces which operate at 1,800° F.

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Wire Rope

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WHEN YOU PULL DOWN COSTS these days it's something to brag about. And with Preformed "Blue Center" Wire Rope you can cut costs to the minimum.

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Roebling Wire Rope is one of the best-known products in industry today. There's a type and size for every kind of service. Have your Roebling Field Man suggest the *one* rope best adapted to your requirements. John A. Roebling's Sons Company, Trenton 2, New Jersey.

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PIPE LINES

Northwest Natural Hearings Resumed

Northwest Natural Gas Co. resumed presentation of testimony at Calgary, Alta., last week before a commission appointed by the Province of Alberta to consider and report on the advisability of exporting natural gas. Hearings were resumed after adjournment over the Christmas holidays. The company has filed with the U. S. Federal Power Commission an application for a certificate of convenience and necessity.

The proposed project would include a 24-in. main line from the gas fields of Alberta to supply Trail and Vancouver, B. C., Spokane and Seattle, Wash., and Portland, Ore.

In presenting testimony for the Northwest company, W. E. Simpson, K.C., Edmonton counsel, said the project would involve expenditure of $100,000,000 of which 40 per cent would be invested in Alberta where facilities would be owned by a company formed in Canada. He reminded the commission that active development of gas reserves in the United States might lead to having the market eventually served by gas from American fields if there would be unreasonable delays in authorizing construction of the Northwest project.

Humble Plans 370-Mile, 16-in. West Texas Outlet

Humble Pipe Line Co. has under consideration a crude-oil pipe-line project which would involve the laying of about 370 miles of 16 or 18-in. pipe from a point in the West Texas fields via the Satsuma station in Harris County to Baytown. The line may be completed in the fall of 1951.

Houston-Beaumont Takeup Is 70 Per Cent Completed

Texas Pipe Line Co. has completed more than 70 per cent of the work of taking up 270 miles of 6, 8, and 10-in. lines from the crude-oil trunk system along the Houston-Liberty-Beaumont, Tex., route. The company has completed an 87-mile, 20-in. crude-oil line between Houston and Port Arthur.

Both the construction of this line and the take-up job have been contracted by Latex Construction Co. This contractor's take-up work is being supervised as follows: H. L. Leake is in charge of take-up near Beaumont where Sam B. Harrison is office manager; H. E. Murphy is in charge of the rack near Beaumont and J. J. Nolan is office manager there; E. C. Norris and J. A. Williamson are in charge of take-up and rack operations at Liberty and East Houston where R. Axson and L. F. Redfearn are responsible for office work.

Western Plans for 710-Mile Project

Western Pipe Lines is in the process of being incorporated with sufficient powers to construct and operate a system for transmitting natural gas from Alberta fields to connections near Winnipeg and St. Boniface, Manitoba. Plans provide for laying branch lines to Saskatoon and Prince Albert, Saskatchewan, as well as to cities and towns in the vicinity of the system's route. Western Pipe Lines is being organized by Osler, Hammond & Nanton, Ltd., Winnipeg.

The Western Pipe Lines system would total approximately 710 miles of pipe line which would include 375 miles of 24-in. in the western section and 335 miles of 22-in. in the eastern section.

El Paso Authorized 730 Miles of 24-30 in.

Pipe-line projects of El Paso Natural Gas Co. authorized but not yet under way include about 730 miles of 24, 26, and 30-in. lines in the Texas-New Mexico-Arizona area.

The 730 miles of line, all of which is to be completed by the fall of 1951, is detailed as follows: From Upton County, Texas, to Jal, N. M., 105 miles of 24-in. to be completed by October 1949; from Eunice, N. M., to Topock, Ariz., 73 miles of 30-in. loops, by October 1951; San Juan Pipe Line, Farmington, N. M., to Topock, Ariz., 450 miles of 24-in. to be completed by October 1950; and to northern Arizona 450 miles of 26-in. crossover to be completed by October 1950.

Projects completed by El Paso Natural Gas Co. in 1948 included 414 miles of natural-gas lines in the Arizona and New Mexico areas. Projects of the company now under way include: Looping of the 26-in. line from Eunice, N. M., to Blythe, Calif., 450 miles of 30-in. to be completed by April 1951; and 105 miles of 8 and 10-in.

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Men Behind the Job
who get the Job Done

H. A. (Red) Wylie has pipelining in his blood. From truck driver to field superintendent, Red has chalked up over 20 years of solid pipelining experience to his credit, and is liked by all who know him. It's men like Red Wylie who make every Oklahoma Contracting job an OK job.

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CONTRACTING CO., Inc.
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DALLAS 1, TEXAS

from Wilcox to Globe, Ariz., to be completed by March 1949.

Burden Directs Pacific Pipe Line & Engineers

Oscar R. Burden is directing operations of Pacific Pipe Line & Engineers, Ltd., a California corporation with headquarters in Los Angeles.

Burden, whose appointment recently became effective will leave Wichita Falls this week. The construction company, which he now heads, has six branches besides the main office in Los Angeles. Branch offices are at El Cerrito, Bakersfield, Santa Maria, Fresno, North Hollywood, and Avenal, Calif.

Burden quit his post in charge of Williams Brothers Corp.'s operations in connection with the Trans-Arabian Pipe Line Co. project last November. He was general superintendent in charge of laying the Big Inch oil line and Little Big Inch lines laid by War Emergency Pipelines, Inc., from Texas to the New York-Philadelphia area.

A native of Texas, Burden became division superintendent of Texas Pipe Line Co. in 1923. He later served as vice president and general manager of Panhandle Producing & Refining Co. In 1942, he became an independent contract driller and pipe-line constructor which he continued until he went with WEP.

Northern Natural Completes Projects

Compressor installations completed by Northern Natural Gas Co. for the fourth quarter last year included seven compressor station additions totaling 8,700 hp. and located in Texas, Kansas, and Iowa. The company authorized compressor station additions totaling 11,200 hp. for installation in Kansas, but they are not yet under way.

Approximately 140 miles of natural-gas pipe lines were added to the company's system in Texas and Kansas in the last quarter of 1948. Line size varied from 4 to 24-in. Projects authorized but not contracted include more than 185 miles of pipe line, varying in size from 4 to 24-in., from Texas to Minnesota.

Those projects completed late last year by Northern Natural and which amounted to installation of 10,600 hp. included: Three field gathering compressor stations with a total horsepower of 1,900, at Skellytown, Tex.—contractor, Fluor Corp.; three 1,400 hp. horizontal compressors added to the main-line station at Mullinville, Kans.,—contractor, Refinery Maintenance Co.; two units of 1,400 hp. added to the main-line station at Oakland, Iowa — contractor, Dresser Engineering Co.; and two units of 850 hp. added to the main-line station at Ventura, Iowa—contractor, J. F. Pritchard & Co.

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NEVER STOPS

OWENS-CORNING
FIBERGLAS
UNDERGROUND PIPE WRAP
Acid Resistance—High Pick-Up Factor—Heat Resistance—No Patching or Splicing—Moisture Resistance—High Porosity—these properties keep Owens-Corning Fiberglas Pipe Wrap the leader in its field of underground pipe protection. For consistent CORROSION CONTROL the first name is always Owens-Corning Fiberglas.

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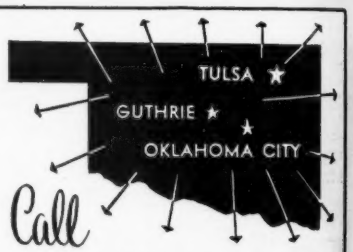

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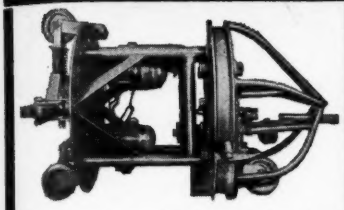
ELECTRIC MODEL
INTERNAL LINE-UP CLAMP



The electric model shown below is a rugged, heavy-duty clamp, electrically operated for the tough jobs.

ADVANTAGES:

For The Owners:

Better stringer bead; better finish weld; better pipe line.

For The Builder or Contractor:

Speed; stringer bead cut-out eliminated; economy; swabbing and alignment with one tool; less labor required.

Available for pipe sizes 12" through 36"
Rental or Outright Sale Basis

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MAIN OFFICE
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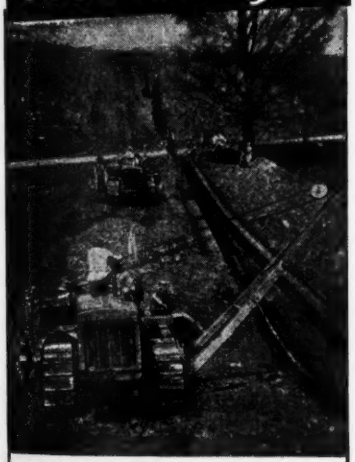

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17 Plants to Serve the Nation

Panhandle to Issue $30,000,000 Debentures

Missouri Public Service Commission recently granted authority to Panhandle Eastern Pipe Line Co. to issue $30,000,000 in sinking fund debentures. The debentures would be due in 1973 with interest not to exceed 3½ per cent. Proceeds would be used to pay off promissory notes and finance additions and improvements.

Panhandle Eastern operates a natural-gas pipe-line system in Texas, Oklahoma, Kansas, Missouri, Illinois, Indiana, Michigan, and Ohio.

Michigan Gas to Add Compressors

Michigan Gas Storage Co. plans the installation of additional compressor units in 1949 at the Freedom Junction and Muskegon River stations.

An additional 800-hp. unit will be installed at the Muskegon River (field) station to raise compressor facilities there to 6,400 hp. Compressor facilities of 2,400 hp. at the Freedom Junction station will effect an increase there to a total of 8,400 hp. This has become necessary due to the change in pipe size planned for the middle and southern section of a projected line from 24-in. to 20-in., since 24-in. became unavailable during the period for the scheduled construction program described on page 112 of the January 6 issue of The Oil and Gas Journal.

Petitions Against Texas Eastern Denied by FPC

Petitions for intervention filed by two Pennsylvania communities, the city of Greensburg and the borough of Latrobe, in proceedings on Texas Eastern Transmission Corp.'s application for authorization to construct and operate facilities which would increase its natural-gas pipe-line system capacity by 75,000,000 cu. ft. daily, has been denied by the Federal Power Commission.

The commission at the same time denied the petition by the Independent Natural Gas Association of America to file brief amicus curiae in the same proceedings.

Contract Let for Illinois Pipe Line

Sheehan Pipe Line Construction Co., Tulsa, has been awarded a contract by Texas Pipe Line Co., for laying a 22-in. crude-oil line from Patoka to Wood River, Ill. Contract announcement was made by R. B. McLaughlin, president of the pipe-line company.

Fifty-five miles of line will be constructed, with the beginning of operations scheduled immediately.

WILLIAMSON PIGS "Tailor Made" for YOUR PIPE LINE

ALL PIGS ARE PROVIDED WITH THE EXCLUSIVE "JET ROTATION" FEATURE*

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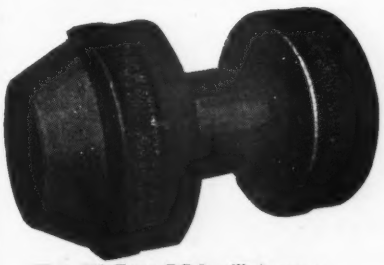
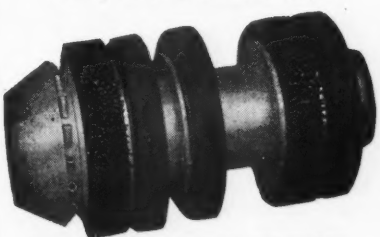
Each Pig Is Designed To Traverse Specified Valves and Fittings — SAFELY

FOR EXAMPLE:

This Type RC-1 Pig, 16" size and larger, is for the usual conditions of:
Conventional gate valves
Full diameter, 90° laterals
Field bends, min. radius 10 ft.



This 22" Type RC-5 will traverse
Through-conduit valves
Full diameter, 90° laterals
Factory ells, 1½ radius, 22½°



Type RC-1 Pigs, 14" size and smaller, must traverse
Various types of gate valves
Elongated side openings (laterals)
Small-angle sharp bends

*Patents pending

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T. D. Williamson, Inc.
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Solid metal and a tight fit.

Snarled rope, scrap, link

A large rock bit

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Makes straight full-gauge hole all the way to bottom, and is a perfect tool for taking core samples.

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Milling action of teeth on side wall reams while it digs.

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Gets everything in the hole, and brings up a full load every trip.

When you run into a fishing job, or have junk in the hole, you need the Globe Patented Junk Catcher quick to minimize loss of time and footage. So keep one handy in every active rig and you'll save many times its cost on every job. It recovers everything, and brings up more on every trip. There are thousands of examples of its efficiency... in practically every oil field.

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Among the

Drilling Contractors

A. A. O. D. C. Directors to Hold Dallas Meeting

Directors of the American Association of Oilwell Drilling Contractors will hold their first meeting of 1949 on January 18, in the Baker Hotel, Dallas, Tex., according to Brad Mills, executive vice president.

A meeting of the association's insurance and safety committee has been called by Dorris Ballew, chairman, for January 17 in Dallas to map the insurance and safety program for 1949.

Rowan Drilling Co. Elects Arch L. Rowan, Chairman

Rowan Drilling Co., Inc., Fort Worth, Tex., has announced the election of Arch L. Rowan to the the post of board chairman. He was formerly vice president and general manager.

M. G. Rowe, chief engineer, will become a vice president, and F. W. Brigance will assume Rowan's former position.

C. L. Rowan will continue as president of the organization.

Van Tuyl Made Chairman Of Tri-State Contractors

Ira Van Tuyl, V-T Drilling Co., Evansville, Ind., has been elected chairman of the Tri-State chapter of American Association of Oilwell Drilling Contractors for 1949. Kenneth Lindskog was elected vice chairman of the group, and Edward Wick was named full-time secretary of the group. Wick succeeds Earl Jukes, who resigned.

Elections were held at the December meeting of the Illinois, Kentucky, and Indiana contractors at Fairfield, Ill.

Ted A. Norwoood Drilling Co. will drill its 3 Gus Donnell, NW SE NW 31-4s-12w, in Cotton County, Oklahoma. This will be a 1,600-ft. test.

Woods Drilling Co. and Wilcox Oil Co. 1 Voyles, BBB&C Survey, A-110, is starting a 5,000-ft. test. Location is 2 miles northwest of Hoefle field in Jack County, Texas.

A. J. Slagter, Jr., will drill the first test of the Granite Wash, located about 18 miles southwest of Sheboygan, Wis., near Gibbsville. Proposed depth of this test is 3,250 ft.

Ben H. Rankin has contract for Warren Oil Corp. 1 Frank Daws, a 5,000-ft. wildcat in Block 733, TE&L Survey, approximately on the center of the east line of Throckmorton County, North Central Texas. Location is west of recently opened Caddo production.

Crew of Wentworth Drilling Co. on Skelly Oil Co. 8 L. R. Baker, Velma, Okla. The men are John R. Nelms, Bud Brown, Hubert Jennings, and L. Simpson, driller

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Length	7' 6"	5'
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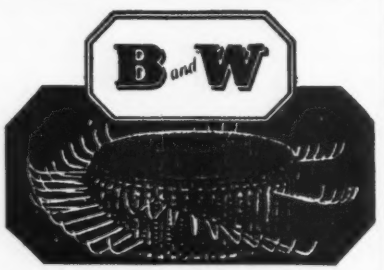

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Williams-Copeland, Inc., Tulsa

Williams-Copeland, Inc., has the guidance of a lifetime of drilling experience with rotary tools in one of its directors, O. D. (Kid) Williams. Twelve years of this time he spent as rotary drilling superintendent with a large drilling company. C. M. Copeland, another of the founders, is an electrical-engineering graduate of Texas A. & M. College. He also is thoroughly experienced in petroleum work, having spent 15 years with a major producing company and 7 years with a drilling company. The third of the founders, Ralph Gwilliam, was formerly associated with a major company as traveling auditor and was also in charge of a district office of a drilling company for 3 years. Gwilliam is a graduate of Cornell University.

O. D. WILLIAMS

C. M. COPELAND

Growth.—The company was founded in September 1942 by Williams, Gwilliam, and Copeland, and had one rig at its beginning. More rigs were purchased later, with the fourth being acquired in March 1944, the fifth in May 1945, and the sixth in July 1946.

Equipment.—Of the six rigs which comprise Williams - Copeland equipment, two are heavy rigs for drilling to 10,000 ft. or deeper. Three other rigs of 6,000-ft. ratings and one light rig constitute the remainder. All rigs are of the power type, either diesel, natural gas, or butane. Five of these rigs are operating in Oklahoma, and one is in the Texas Panhandle.

Williams-Copeland is solely a contracting company, having no production of its own. Most of its drilling is carried on under contract with major companies, a small portion of it being contracted to independents.

Personnel.— Al Cunningham and Andy Baugh are tool pushers operating out of Oklahoma City, and Henry Robertson is tool pusher in the Texas Panhandle. Williams and Copeland supplement the tool pushers by carrying on some field work out of the Tulsa office.

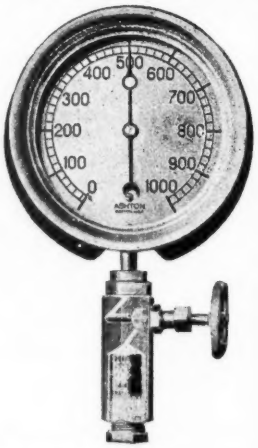
Harvey Drilling Co. will drill a 5,000-ft. wildcat for A. R. Dillard as the 1 Addie Ware, 331 ft. from north and west lines of a 25-acre tract in the B. F. Baker Survey. Location is south of Woodbine field and about 1¾ miles southeast of Woodbine in eastern Cooke County, Texas.

Finlayson Drilling Co., Tulsa, has been granted a $20,000 charter. Incorporators are R. L. Jeffries and C. R. Jeffries of Evansville, Ind., and John K. Finlayson, Tulsa.

CAMPBELL

MICRO-BEAN

Stabilizes Gauges and Pump Governors



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STANDCO BRAKE LINING

Nothing novel — no bunk, but it gets the job done without scoring brake rims. See pages 3608-3613, Composite Catalog.

Standco Brake Lining Co.

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CHARLES A. STEELE
Attorney-at-Law

C. H. SWEET
Vice-President, National Bank of Tulsa

STATEMENT OF CONDITION

December 31, 1948

RESOURCES

Cash and Due from Banks	$58,944,222.26	
U. S. Government Securities	74,027,290.97	
Other Bonds and Warrants	4,177,575.37	$137,149,088.60
Loans and Discounts		33,897,667.14
Overdrafts		2,275.20
Income Receivable Accrued		479,631.02
Prepaid Expenses		37,744.79
Stock in Federal Reserve Bank		180,000.00
Bank Premises		2,000,000.00
Customers' Liability Under Acceptances		26,620.00
TOTAL		$173,773,026.75

LIABILITIES

Deposits		$162,851,527.33
Acceptances Executed		26,620.00
Income Collected, Not Earned		123,583.71
Reserve for Taxes, Interest, etc.		410,930.96
Dividends Declared*		150,000.00
Capital—Common	$3,000,000.00	
Surplus	3,000,000.00	
Undivided Profits and Reserves	4,210,364.75	10,210,364.75
TOTAL		$173,773,026.75

*Payable—$75,000 January 15, 1949, $75,000 April 15, 1949

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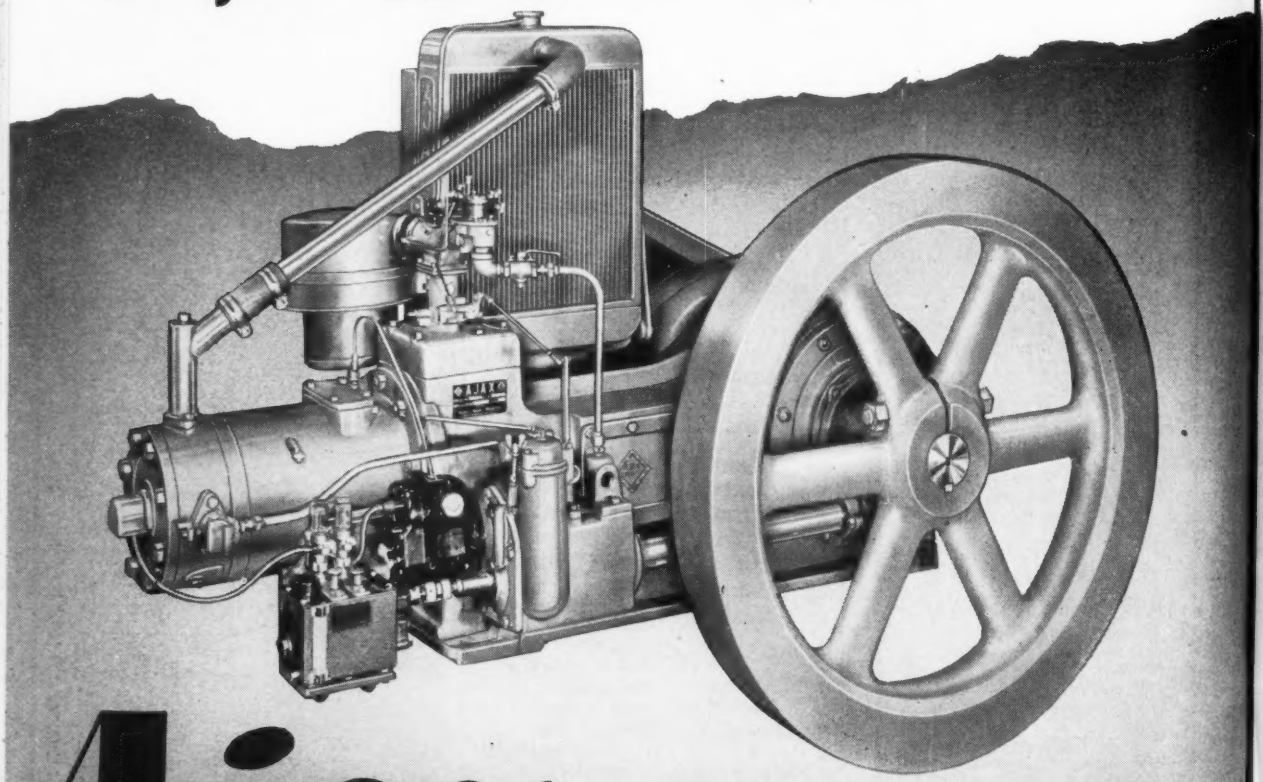
The Oil Bank of America

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

DEPENDABLE LOW-COST OPERATION
for your TOUGH, CONTINUOUS jobs



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- No oil contamination
- Double-row frictionless bearings
- Modern design

AJAX Engines are simple and sturdy. They keep on rolling month in and month out. You don't have to worry about them or baby them; they do the jobs they're built to do. • Behind such performance is the fine engineering you'd expect AJAX to apply . . . fine materials, and fine craftsmanship. *Check the details with your Supply Man!*

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REFINING

1947 Lubricating Sales By States, Types Reported

Sales of automotive oils comprised 54 per cent of all oils sold in the United States during 1947 compared with 31 per cent for industrial lubricating oils, 14 per cent for other industrial oils, and 1 per cent for aviation oils, it was revealed in a report prepared by the Department of Commerce in cooperation with the American Petroleum Institute.

The report was a result of the first national survey of sales of lubricating oils and greases by states and by types. Total domestic and export sales reported in the survey were 50,320,911 bbl. or an estimated 95 per cent of all sales. The remaining 5 per cent is accounted for by a few scattered small firms and one of the larger companies which failed to submit sales data.

The five states, Texas, California, New York, Pennsylvania, and Ohio, each consumed between 1,000,000 and 1,500,000 bbl. of automotive oils and together accounted for 32.8 per cent of the total for the United States. These same states have about 34 per cent of the country's registrations of consuming vehicles, the report said.

Pennsylvania lead all states in the consumption of industrial oils, using 1,628,245 bbl. Pennsylvania and other leading industrial states of New Jersey, Ohio, Texas, New York, Illinois, and California consumed 63 per cent of the total.

Illinois reported the highest consumption, 775,925 bbl., of other industrial oils. This amount plus that consumed by Pennsylvania, Michigan, California, New York, Massachusetts, Indiana, and Missouri make up 71.8 per cent of the total market for these oils.

Four Oil Companies in Basic Research Program

Four oil companies are among the total 16 companies now participating in the University of Chicago's basic research program, which includes institutes for nuclear studies, metals, and radiobiology and biophysics. Oil-company members include: Shell Oil Co., Inc., Sun Oil Co., Standard Oil Development Co. of New Jersey, and Standard Oil Co. (Ind.).

The University of Chicago receives $50,000 a year for 5 years from a company holding memberships in all three institutes. The charge for membership in one institute is $20,000 per year for 5 years.

Survey Shows Gain in Gasoline Octane Ratings

Octane ratings of regular and premium-priced gasolines sold in American service stations during the summer of 1948 were slightly higher than the ratings of those gasolines sold in the preceding two summers, according to semiannual survey of motor fuels released this week by the U. S. Bureau of Mines.

The report, based on analyses of 2,997 samples of gasoline from 17 marketing areas throughout the nation, shows that the octane ratings of regular gasolines sold in the summer of 1948 averaged 75.2 compared with 75.1 for the summer of 1947 and with 74.4 during 1946. The ratings of premium-priced gasolines last summer averaged 79.5 as compared with 79.2 during the previous summer and with 78.3 and 74.9 respectively, for the two preceding summers.

This survey made last summer was the second made by the Bureau of Mines in cooperation with the American Petroleum Institute, and included service-station gasolines of 115 major and minor companies. However, 23 previous surveys had been made since 1935 in cooperation with the Coordinating Fuel Research Council, Inc. Statistical data contained in the report were compiled by O. C. Blade, associate petroleum chemist at the bureau's petroleum experiment station in Bartlesville, Okla.

Many 1949 Job Openings to Occur in Service Stations

According to a U. S. Employment Service study, thousands of job openings, due to turnover, will occur during 1949 in filling stations. "There has been a tremendous increase in filling-station business in the postwar years, more cars are on the road than before the war. . . . While business has soared, the number of attendants has also increased although at a much slower rate," the report asserted.

"The bulk of future employment demands, however, will arise from the thousands of job opening for attendants created each year by retirements, deaths, and shifts to other occupations as well as the relatively high job-changing rate which is char-

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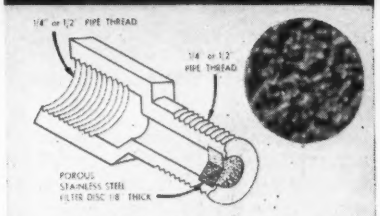

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These new snubbers utilize a porous stainless steel disk as the primary element to eliminate pulsations. They can be used to protect all types of pressure sensitive instruments. Namely, pressure gauges; pressure indicating and recording controllers; diaphragm type differential meters; U-tube manometers; differential flow meters; pump governors; and diaphragm regulators. They also can be used as filters or as flow meters on small flows.
The porous disk is made in several standard Grades. Special grades made to suit application.
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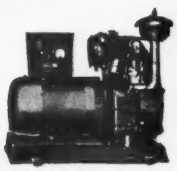

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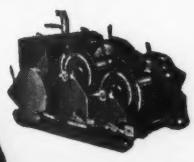

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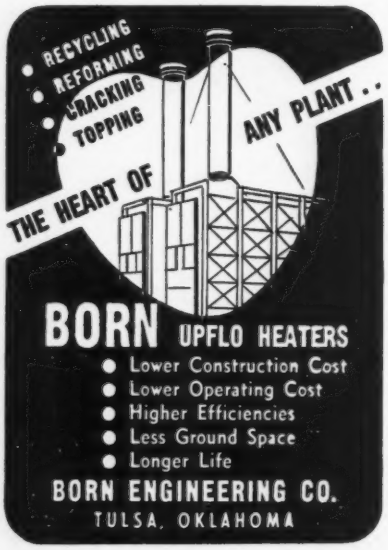
acteristic of the occupation," the report added.

Socony Completes Storage Tank Construction Program

To meet increased demand for home-heating fuel and other petroleum products on the East Coast, Socony-Vacuum Oil Co., Inc., has rushed to completion a storage-tank construction program in more than 25 cities in New York, New England states, and other parts of northeastern United States.

The additional tank facilities, with more than 61,000,000 gal. capacity, will assist materially in improving supplies and distribution of petroleum products in that area.

Construction of the new tanks started last spring together with a multi-million dollar refinery expansion program and construction of new pipe lines in Pennsylvania, Maine, New York, and from Corsicana, Tex., to Patoka, Ill.



Contract Awarded for Humble Bulk Station

HOUSTON.—Contract has been let to Texas Gulf Construction Co. to build a new central bulk plant for Humble Oil & Refining Co. in this city.

No cost figures have been released, but the new plant will consist of the following: warehouse with area of 42,000 sq. ft., office building, shop and garage, barrel cleaning plant, barreling rack, 9 light-products storage tanks, 21 oil storage tanks, and a new railroad spur. The new plant will be located adjacent to the Humble specialty products plant.

Oronite Starts Production Of Lubrication Additives

Oronite Chemical Co., a subsidiary of Standard Oil Co. of California, has commenced manufacture of an extensive line of lubrication-oil additives.

The products, developed by California Research Corp., also a Standard of California subsidiary, will be made available as finished concentrates, ready for blending with base stocks to produce high-grade diesel and motor lubricants in accordance with customer requirements. Also, they will be available as individual chemical compounds for use as lubricating-oil detergents, antioxidants, and corrosion inhibitors.

Sinclair to Build Large Terminal at Jacksonville

Sinclair Refining Co. is dismantling five building ways at the former St. Johns shipbuilding yard in Jacksonville, Fla., to clear the area for construction of a 330,000-bbl.-capacity oil terminal.

During the initial construction period, six storage tanks are planned. They include: 90,000-bbl. gasoline tank; 55,000-bbl. ethyl-gasoline tank; 20,000 bbl. solvents tank; 55,000-bbl. tractor-fuel tank; 55,000-bbl. diesel-oil tank; and 55,000-bbl. kerosine tank.

Heavy-Duty Winter Grease Developed by Texaco

A new soft consistency grease, H Grease O, has been developed by The Texas Co. for winter use in heavy-duty industrial service. With a lime soap base the new grease is gold in color and is particularly suitable for low-temperature applications.

The new H Grease O completes the H grease series which is designed for general purpose industrial service where higher viscosity mineral oils are required than in conventional cup greases.

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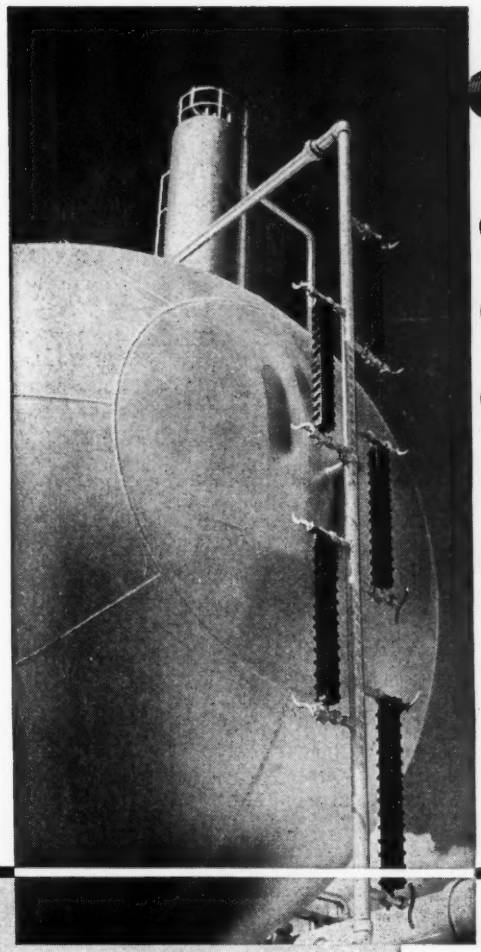

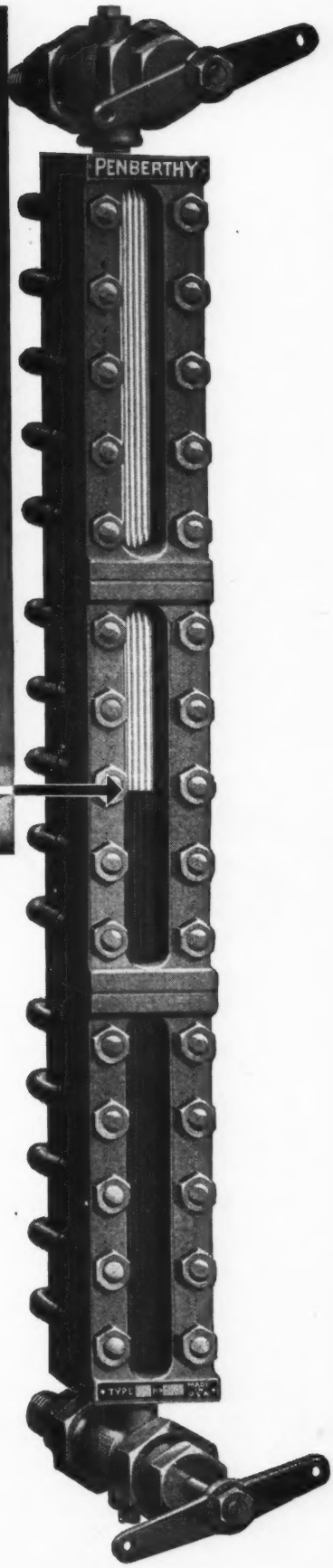

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Exploration and Drilling

Scientific Importance of Definitions

THE key theme of the joint annual meeting of the three exploration societies next March in St. Louis will be limestone reefs. Currently this is one of the subjects of great interest and importance to oil-hunting geologists. Following their customary procedure, when a subject becomes of sufficient timely interest to a substantial number of professional men, the three societies program a joint attack on the problems.

The happenings of the past couple of years in Canada and West Texas have brought the problem of limestone reefs to the front. In March at the St. Louis meeting, a series of papers by important authors will bring to a focus the accumulated knowledge, and point up some of the major problems that need further work.

The paleontologists and mineralogists will contribute their knowledge from their specialized angles. The geophysicists will discuss their latest developments in the instrumental techniques and interpretation, as they apply to limestone reefs. In other words, if the geologist tells the geophysicist to suspect the presence of reefs in an area where he is working, what special procedures and techniques should the geophysicist adopt for that particular area? The geologists will discuss how to correlate all the information that can be gleaned, and what methods of coordination of paleontology, geophysics, and geology, seem to get best results. Best results of course is defined as "finding an oil field."

Even before the meeting, it is becoming apparent that one of the primary needs is a definition of the term reef, so that everybody will be talking about the same thing. It sounds quite elementary, and needless perhaps, from a layman's point of view. But scientists have learned the hard way that such things happen to be a lot more vital to a program of joint scientific attack than the layman might think.

Therefore, among the many items of preliminary work that is going on to get ready for a successful meeting, many geologists have been discussing the definition of a reef. It has finally reached the stage where a tentative definition is being circulated among the V.I.G.'s (very important geologists) to see if general agreement can be reached. Here is one of the preliminary versions being circulated.

"For the purpose of clarifying discussion at this symposium and in an attempt to give definite and useful meaning to a term that is being more frequently used in subsurface petroleum geology, a reef is here defined and described as follows:

"A reef is a sedimentary rock aggregate, large or small, composed of the remains of colonial-type organisms that lived near or below the surface of water bodies, mainly marine, and developed substantially large vertical dimensions as compared with the proportions of adjacent sedimentary rocks.

"The organisms creating the essential features of a reef lived their mature lives in it, and their hard parts remain in place there after death. A rigid framework is developed that does not compact under weight of overburden. This framework enables a reef margin to grow upward at much steeper angles, (even vertical) than is the case with sedimentary clastic rocks. Reefs are commonly characterized by lack of well-developed stratification. Differential settling in rocks adjacent to them usually causes draping of strata over reefs. The extra weight of rocks may cause downward bending of strata under them. Clastic materials or chemically precipitated rocks may be in reefs, but are not distinctive parts of them."

It is then suggested that the definition given above should be considered as supplementary to Cummings' classic definition of a bioherm, which reads as follows:

"A bioherm . . . is defined as consisting of any dome-like, mound-like, lens-like, or otherwise circumscribed mass, built exclusively or mainly by sedimentary organisms such as corals, stromatoporoids, algae, brachiopods, mollusca, crinoids, etc., and enclosed in a normal rock of different lithologic character."

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

WEST TEXAS.—Magnolia Petroleum Co. had prospects of a second and better producer at its Scurry County wildcat north of its 1 Winston discovery. First tests of the Pennsylvanian were estimated at 30 bbl. an hour, flowing through ½-in. choke. In Gaines County, The Texas Co. deepened an old wildcat failure to the Glorietta and recovered oil on two drill-stem tests. A deep test in the Wasson field recovered clean oil from the Devonian.

NORTH TEXAS.—In southeast Wise County a wildcat showed gas but no oil in the Bend conglomerate. Shackelford County's Ellenburger discovery planned to drill ahead to the Hickory sand, and is reported to be the county's first pre-Cambrian test. East of Padgitt in Young County, R. C. Lipscomb 1 Furr & Allar, Mississippian discovery, gaged 172.8 bbl. of oil in 16 hours through 14/64-in. choke on completion tests.

ROCKY MOUNTAIN AREA.—Stanolind recovered water on test in the lower Tensleep at its first deep test in the Beaver Creek field, Fremont County, Wyoming, and is drilling ahead for the Madison. Seaboard Oil Co. and Husky Refining Co. are completing their Tensleep discovery at Little Sand Draw, Hot Springs County, Wyoming, after the well made 3,960 ft. of oil and mud on 1-hour drill-stem test.

MID-CONTINENT.—Another well in the Elk City area of Beckham County, Oklahoma, has found oil. Shell Oil Co. 1 Kelly, south of the discovery well, flowed at the estimated rate of 960 bbl. per day on drill-stem test at 9,605-83 ft.

TEXAS GULF COAST

Morgan's Creek Is New Field in Polk County

HOUSTON.—A new oil field, Morgan's Creek, Polk County, has been opened by Carlton D. Speed, Jr., 2 C. C. Perkins, in the Isaac Parker Survey, 1½ miles northeast of Goodrich townsite. Perforations were made in the Jackson sand from 3,305-24 ft., for completion and on a 24-hour estimated test the flow was 242 bbl. of 29°-gravity oil per day through a ¼-in. choke. Flowing pressure on casing was 200 psi. The No. 1 Perkins was the first test to find oil, but as yet has not successfully completed as a commercial producer.

Western Natural Gas Co. 1 M. E. Cooley et al, discovery well for the new "West Mission Valley" field of Victoria County, is showing for a good gas-condensate producer on gage through perforations at 8,895-25 ft. Total depth is 9,082 ft. Located approximately 7 miles southwest of Mission Valley townsite in the Benjamin J. White Survey A-354.

James G. McCarrick Tr. 1 A. J. Wilder Estate, new oil discovery well 1 mile west of the old Fort Merrill field of southeastern Live Oak County, flowed 80 bbl. of oil per day through a ⅛-in. choke, on drill-stem test through perforations at 4,538-44 ft. and 4,546-48 ft. Total depth is 4,775 ft. Operators are running completion test. This well is located in P. Salinas Survey, 3 miles southeast of Mikeska.

A new pay zone for Keeran field of Victoria County has been opened by Gulf Oil Corp. 20 G. Keeran et al, located in the Martin de Leon Grant. The well flowed 68.38 bbl. of 37.9°-gravity oil per day through 3/32-in. and ⅛-in. chokes, with 2,450 psi. tubing pressure, and gas-oil ratio of 12,977, through perforations at 6,622-24 ft. Top of pay sand 6,610 ft., and total depth 7,748 ft.

Southern Production Co. 1 Melbourne, discovery oil producer from the lower Frio zone in Calhoun County, has run potential gage of 134 bbl. of 45.5°-gravity oil per day through ⅞-in. choke, 1,370 psi. tubing pressure. Production is through perforations at 8,587-97 ft. Top of pay zone 8,587 ft., total depth 10,009 ft. Well is located in Benito Morales Grant, 6½ miles southsoutheast of Port Lavaca and 5 miles southwest of Magnolia Beach.

The 27 new locations for Districts 2 and 3 included 8 wildcat starts, 2 in San Jacinto, and 1 each in Calhoun, Goliad, Harris, Karnes, Live Oak and Wharton counties. Four successful exploratory tests were completed, 1 each in Brazoria, Harris, Lavaca, and Liberty counties, while 12 wildcats were dry, 3 in Brazoria and 1 each in Calhoun, Goliad, Harris, Jefferson, Libery, Madison, Montgomery, Refugio, San Jacinto and Victoria counties.

TEXAS GULF COAST (DISTRICTS 2 & 3) SUCCESSFUL WILDCATS

Brazoria County: Gas discovery, Damon Mound area—The Texas Co. 1 Continental Oil Co. fee, in E. S. Jones Sur., 1 mi. off southeast flank, TD 4,100 ft., top sand 3,966 ft., perf. 3,966-74 ft., IP: 2,250,000 cu. ft. gas per day on open flow, TP 1,400 psi., no water.

Harris County: Oil discovery—F. M. Corzelius 1 H. H. Rath, in Wm. Sevey Sur., 1 mi. NW of Aldine townsite, TD 7,800 ft., top sand 7,089 ft., perf. 7,089-94 ft., IP: 15 bbl. oil per day through ⅞-in. choke, GOR 1,200, TP 125 psi., CP 1,400 psi., gravity 38.6°.

Lavaca County: New gas pool—Grubb & Hawkins 1 S. A. Clark, in J. H. Clayton Sur., 12 mi. SE of Hallettsville and 4 mi. W-SW of Provident City field, TD 5,833 ft., open hole below surface casing, 10¾-in. casing at 1,643 ft., IP: 1,246,000 cu. ft. gas per day through ¼-in. choke, TP 675 psi.

Liberty County: New oil pay, North Dayton pool—The Texas Co. 1 John A. Deering et al, NCT-1, H&TC Sec. 135, an east flank, TD 3,168 ft., top sand 2,700 ft., perf. 2,700-10 ft., IP: 145 bbl. oil per day through 11/64-in. choke, TP 325 psi., gravity 39.2°.

TEXAS GULF COAST (DISTRICTS 2 & 3) WILDCAT FAILURES

Brazoria County: Paul M. DeMotte et al 1 Elmira Bryan et al, in A. Darst Sur. A-66, in Damon Mound area, dry, TD 2,228 ft.

Paul M. DeMotte et al 1 T. H. Bryan, in A. Darst Sur., in Damon Mound area, dry, TD 110 ft.

Calhoun County: Ryan Consolidated Pet. 1 Henry J. Hahn, Miguel Lopez Sur., 1¾ mi. E of Green Lake, dry, TD 6,068 ft.

Goliad County: Ginther, Warren & Ginther 7 Carrie G. Wood et al, in Sarah Hall Sur., 13 mi. S of Goliad, dry, TD 5,270 ft.

Harris County: Butcher-Arthur, Inc., 1 J .E. Antle, in J. W. Singleton Sur., 2 mi. N of Baytown, dry, TD 8,359 ft.

Jefferson County: Placid Oil Co. 1 W. E. Orgain, in P. H. Bell Sur., 12 mi. S of Hamshire townsite, dry, TD 11,158 ft.

Liberty County: William Herbert Hunt Tr. Est. 3 Welch & Silva, in T&NO Sur., dry, TD 8,248 ft.

Madison County: F. H. Carpenter and A. E. Hervey 1 R. W. Connor, in Thos. Boatright Sur., 2 mi. SW of Madisonville, dry, TD 3,511 ft.

Montgomery County: D-B Oil Co. 1 Estate of W. D. Cleveland, Humble area in Wm. Massey ⅓rd Lge., 2 mi. N of Humble townsite, dry, TD 3,657 ft.

Refugio County: Fred W. Shield 1 F. B. Brooke & Sons, 4 mi. SW of Refugio field, in Thos. Mullen Sur., dry, TD 7,110 ft.

San Jacinto County: S. A. Brewster and W. O. Bartle 1 Lucy B. Modesett, 9 mi. E of Shepherd, dry, TD 8,894 ft. Old well drilled deeper.

Victoria County: Rock Hill Oil Co. et al 1 John C. Heibel, in Rafael Manchola Gr., SW of West Pridham Lake field, dry, TD 5,105 ft.

APPALACHIAN FIELD

Operations Reflect Seasonal Slump

PITTSBURGH.—Drilling operations in the Appalachian area continued shut down for the end of the holiday period and also in some cases due to high water conditions.

In Patton Township, Allegheny County, Pennsylvania, P. A. Witherspoon completed the 1 G. M. Johnson in the Speechley sand with gas testing 1,200,000 cu. ft. Total depth was 2,724 ft. In Conemaugh Township, Indiana County, Peoples Natural Gas Co. 1 Geo. Schmidt was brought in at 1,490,000 cu. ft. of gas, with total depth at 1,895 ft. In Derry Township, Westmoreland County, the same company's 4-3,814 Camilla Giffin is cleaning out after shooting a bad hole at 7,911 ft., and in Unity Township, its 3,830 Wm. Piper is drilling at 5,690 ft. In Napier Township, Bedford County, South Penn et al, Snee & Eberly 1 Jesse B. Miller, wildcat, is drilling at 930 ft. In Cherry Township, Butler County, Hill Oil & Gas Co. 1 Joseph Duffy is drilling at 3,481 ft.

In Steele district, Wood County, West Virginia, Godfrey L. Cabot, Inc., 1,282 Jacob Gates, wildcat, is drilling at 3,335 ft. In Davis district, Tucker County, Cumberland & Allegheny Gas Co. 1-A-418 West Virginia Power & Transmission Co. is drilling at 8,157 ft. In Glade district, Webster County, Hope Natural Gas Co. 9,227 West Virginia and Pittsburgh Railroad Co. is drilling at 6,314 ft. and its 9,300 Jesse Powell, in Grant district, Jackson County, is drilling at 2,597 ft.

There were 4 new locations reported in southwest Pennsylvania, and 20 in West Virginia.

SOUTHWEST TEXAS

Humble Gets Discovery Well in Kenedy County

CORPUS CHRISTI.—Humble Oil & Refining Co. 1 S. K. East, discovery oil well in the "Rita" area of northwestern Kenedy County, has been gaged at 270 bbl. of 43°-gravity oil per day through a ⅞-in. choke on potential test. Production is through perforations at 7,076-78 ft. Total depth is 11,282 ft., and 5-in. liner was set to bottom, to test deeper sands. Well was plugged back to 7,100-ft. level for completion. Test at 5,975-82 ft. recovered 490 ft. of oil. This well is 16 miles southwest of Sarita, in the Los Finados Grant. Company has location staked for No. 2 East, 5,903 ft. southeast of the discovery.

A new gas-condensate field for Hidalgo County, 2 miles southwest of Edinburg, has been opened by Magnolia Petroleum Co. 1 Carlson Unit, in A. J. McCall Subdivision, Porcion 68. On drill-stem test through perforations at 7,580-7,640 ft. the well gaged 6,508,000 cu. ft. of gas per day, with 2,378 psi. tubing pressure. Well now is shut in for completion test.

Continental Oil Co. 6 Dee Davenport et al, extension oil well in Borosa field area of Starr County, flowed 165.77 bbl. oil per day on potential gage through perforations at 4,706-16 ft. in a new pay zone for the field. Top of pay 4,706 ft., and total depth is 4,784 ft. The well is approximately ½ mile south-southeast of previous oil production in this area.

Transwestern Royalty Co. 1 C. Solis, discovery well of a new pay zone and an extension well for the new North Fitzsimmons field of Duval County, gaged 45.9 bbl. of oil per day on pump on potential test, making 44°-gravity oil through perforations at 4,428-38 ft. Top of new pay zone 4,400 ft., and total depth 4,469 ft. Well is located in J. Poitevent Survey 143.

There were 24 new locations reported for Southwest Texas this week of which 10 are wildcat starts, 2 each in Brooks, Duval, and Jim Wells counties, and 1 each in Jim Hogg, Nueces, Starr, and Webb counties. Two successful exploratory tests were completed in Brooks and Frio counties, and 10 wildcats were dry, 2 each in Duval, and Nueces, and 1 each in Brooks, Cameron, McMullen, San Patricio, Travis and Webb counties.

SOUTHWEST TEXAS (DISTRICTS 1 & 4) SUCCESSFUL WILDCATS

Brooks County: New oil pool, Palo Blanca—Geo. H. Echols 1 Mrs. Donal Alexander, in Las Megueyes de Palo Blanco Gr., TD 3,616 ft., perf. 3,607-12 ft., IP: 121 bbl. oil per day through 10/64-in. choke, GOR 1,980, TP 850 psi., CP 400 psi., gravity 40.8°.

Frio County: New oil pool "Doering"—Humble Oil & Refg. Co. 1 Frank Doering, in Oscar Crawford Sur. 10, 14 mi. NW of Dilley and 5 mi. SW of Pearsall field, TD 6,645 ft., plugged back depth 5,776 ft., open hole 5,399-5,776 ft., IP: 73 bbl. oil per day on pump, GOR 162, CP 320 psi., gravity 26°.

SOUTHWEST TEXAS (DISTRICTS 1 & 4) WILDCAT FAILURES

Brooks County: Amerada Petroleum Corp. 1 Romulo Garza, in Share 2, Loma Blanca Gr., dry, TD 8,598 ft.

Cameron County: Taylor Refining Co. 1 Fred Schwebel, in La Feria Gr., East Lacy area, dry, TD 8,504 ft.

Duval County: J. W. Gorman 1 R. H. Palacios, in Jose Marcello Ynojosa Gr. 40, dry, TD 5,023 ft.

Ryan, Hays & Burke 1 Otilia Garcia de Olivares, in Share 7, Francisco Cordente Gr., 2 mi. E of Sejita, dry, TD 4,510 ft.

McMullen County: Harold K. Boysen et al C-1 Hagist Ranch, Inc., in H&TC Sur. 7, 14 mi. W of Freer, dry, TD 2,392 ft.

Nueces County: Rand Morgan D-1 fee, in

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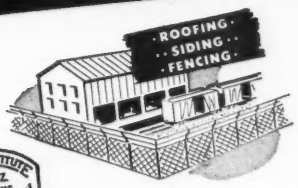

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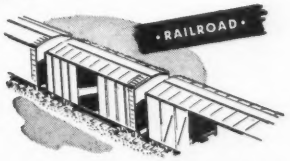

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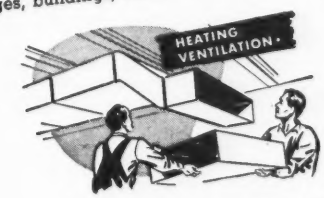

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Town_____ State_____

Sec. 8, Ragland Farm trs., 6 mi. N of Agua Dulce, in Casa Blanca Gr., dry, TD 5,775 ft.

Renwar Oil Corp. and L. A. Douglas 1 J. I. Hall, in C. C. Hart Sur. 414, dry, TD 6,015 ft.

San Patricio County: Rudco Oil & Gas Co. 1 Lizzie J. Berry, in M. P. J. & N. Delgado Sur 4, Juan de la Garza Sur., 6 mi. E-NE of Mathis, dry, TD 5,510 ft.

Travis County: E. R. Marts 1 B. H. Bloor, Wm. Saunders Sur., 8 mi. E of Austin, dry, TD 1,293 ft.

Webb County: Taylor Refg. Co. 1 W. R. Hughes, in C&M Ry. Sur. 1525, 5½ mi. NE of Nicholson field discovery, dry, TD 7,510 ft.

MICHIGAN

Basin Co. Gets Discovery Well in Allegan County

MOUNT PLEASANT. — One of seven Michigan wildcat completions during the current period was rated a wildcat discovery in Allegan County, Basin Oil Co. 1 Noteboom, NW SW NW 18-2n-11w, Allegan County, was completed as an 18-bbl. pumping well in the Traverse at a total depth of 1,618 ft. Traverse limestone was logged at 1,617 ft. Well was acidized.

Welsh Oil Co. 2 Munger, NE NE NE 18-15n-18w, potential wildcat discovery producer in Oceana County, failed to show as much promise on extended pump tests as was first indicated following acid treatment of a Dundee oil pay. On a more settled test, operators reported that daily production was averaging about 10 bbl. with some water showing. Water was believed to be a combination of acid and Traverse horizon water which had been forced into the Dundee pay section. Well was drilled into the Dundee without the benefit of 5-in. casing and with a hole full of Traverse water showing. Dundee was logged at 2,153 ft. and hole was bottomed out at 2,167 ft. Pumping unit had been installed at midweek.

During the current week, 23 wells were completed in Michigan. There were 12 oil well completions, 1 gas well completion and 10 dry hole completions. Four of the 10 failures were development field wells.

In 1948 the Department of Conservation approved a total of 918 drilling permits for wells of all classifications. This was the largest number of permits written in any one year since 1941 when 1,044 permits were approved. There were 887 permits approved in 1947.

MICHIGAN SUCCESSFUL WILDCAT

Allegan County, Martin Township: Basin Oil Co. 1 August Noteboom, NW SW NW 18-2n-11w, 18 bbl. after acid from Traverse, TD 1,618 ft.

MICHIGAN WILDCAT FAILURES

Allegan County, Manlius Township: Ohio Oil Co. 1 R. E. Martin, SE SE NE 20-3n-15w, dry in Traverse, TD 1,441 ft.

Valley Township: P. K. Degenther 1 U. S. Government, NW NW SW 36-2n-14w, dry in Traverse, TD 1,416 ft.

Clare County, Lincoln Township: Sohio Petroleum Co. 1 L. L. Nichols, SE SW NW 5-18n-5w, dry in Dundee, TD 4,042 ft.

Gratiot County, Washington Township: Chapman Oil Co. 1 Joseph Fabus, Jr., NW NW SE 26-9n-2w, dry in Traverse, TD 2,567 ft.

Lake County, Cherry Valley Township: H. E. Walton 1 Josef Checinski, NW NW NW 23-18n-12w, dry in Monroe, TD 3,496 ft.

Montcalm County, Cato Township: Moco 1 Anna C. Diamond, NE SW NE 30-12n-8w, dry in Monroe, TD 3,602 ft.

Ogemaw County, Foster Township: Sun Oil Co. 1 Orla L. Maine, SW NE SE 19-24n-1e, dry in Richfield, TD 4,299½ ft.

ROCKY MOUNTAIN

Stanolind's Beaver Creek Well to Be Madison Test

DENVER.—Stanolind Oil & Gas Co. tested water in its deep test on the Beaver Creek structure, Fremont County, Wyoming, at 1 Unit, CN½ SE¼ 10-33n-96w. The test was made between 10,533-10,630 ft. and in 1½ hours the well made 220 ft. of water cushion, a blow of air and 2,500 ft. of water with a strong sulfur odor. This well topped the Tensleep at 10,442 ft., and the well filled at the rate of 8 bbl. of 42°-gravity oil per hour on previous tests. The operator is now coring below 10,643 ft. with the well projected as a Madison test. Cores between 10,585-10,630 ft. showed 45 ft. of hard grained, fine sand with oil staining. This is Stanolind's first test below the Sundance in this field, which produces gas from nine wells in the Lakota formation. It is expected Stanolind can make a commercial oil producer from the Tensleep in this well.

Seaboard Oil Co. and Husky Refining Co. are preparing to complete the Little Sand Draw discovery at 1 Government, NW NE SW 2-44n-96w, Hot Springs County, Wyoming, after testing 2,700 ft. of clean oil on drill-stem test with total depth at 6,119 ft. The drill-stem test was made between 6,099-6,119 ft. and a total recovery of 3,960 ft. of fluid was made in 1 hour. The operator has cemented casing at the top of the sand, at 6,056 ft. and has recovered oil on several tests in this formation. The operators also found oil in the Phosphoria in this well, but will undertake a drilling program to that formation later, with completion of the present discovery in the Tensleep.

Considerable interest is being shown in the Esperado Mining Co. wildcat in the Northwest Lodgepole area at 1 Government, C SE SW 16-45n-76w, 30 miles northwest of Mush Creek, Weston County, Wyoming. This well is now reported below 7,500 ft. in the Dakota formation and shows of oil are reported both in the Dakota and Newcastle sands. The operator has not confirmed reports, nor released data on formation tops or tests on the well. This well is of importance in an area where there has been considerable leasing following shows of oil in the Dakota in Bay Petroleum Corp.'s Lodgepole wildcat. Following the development drilling in the Mush Creek field last year there have been wildcat endeavors north, south and west of the field, with subsequent discovery of oil at Fiddler Creek and Skull Creek. A number of new wildcats are now proposed for the general area, and the discovery of commercial production at the Esperado test would again cause a great deal of leasing and drilling in the area.

Two wells of interest in south-central Colorado are now being drilled. Both wells are scheduled as tests of the Arbuckle and are on blocks acquired by Colorado Fuel & Iron Co. Gulf Oil Corp. acquired a block in the Tepee Buttes area and spudded its 1 Unit, SE SE NW 36-18s-56w, Crowley County, on December 31. Southeast of the Gulf block J. B. Stoddard of Dallas is now drilling below 4,000 ft. at 1 Wright, C SE NE 11-20s-58w, in the Bob Creek area, Crowley County, and this well is also projected to around 7,000 ft. for a test of the Arbuckle. Colorado Fuel & Iron acquired these and other blocks more than a year ago and the wells are reportedly based on gravity and seismic work in the area.

New locations.—There were 12 new locations, with 5 in Wyoming, 4 in Montana, and 1 each in Colorado, northern New Mexico and Utah. In Wyoming, Pure Oil Co. announced location for the third well in the West Poison Spider area at 3 Unit, SW NW SE 10-33n-84w, Natrona County, Wyoming. This well is 1 mile west of the discovery well, which found production in the Frontier at 14,309 ft., total depth, and ½ mile southwest of the recent completion, a flowing well from a sand in the Mesa Verde formation. Stanolind has made location for an important wildcat in the Canyon Creek area at 1 Unit, C NE NW 3-12n-101w, Sweetwater County, Wyoming. This will be a 12,000-ft. Dakota test on a structure similar to the Church Buttes field, 75 miles northwest. Byrd-Frost, Inc., Western Natural Gas Co. et al are moving in materials for the second well in the Dove Creek area, Montezuma County, Colorado, where a gas and distillate discovery was recently made in the Paradox formation. The new well will be 1 White, C NW NE 9-38n-19w, southwest of the discovery.

Completions.—There were 17 wells completed with a total daily initial of 2,880 bbl. of oil daily. Nine of the wells were in Wyoming, four in Colorado, three in Montana and one in Utah. In Colorado American Liberty Oil Co. of Dallas abandoned the 10,544 ft. test in the Paradox area, Montrose County, and other shallow wells in the area were temporarily suspended. In Wyoming, Ohio Oil Co. and Stanolind listed final completion on the Enos Creek deep test. The well established a new pay in the Tensleep formation with a pump gage of 160 bbl. of oil daily from the base of the Tensleep. The well is now producing from the top of the formation and oil was also recovered on tests of the Phosphoria, but the well is not producing from that zone.

WYOMING SUCCESSFUL WILDCAT

Hot Springs County, Enos Creek: Ohio and Stanolind 1 L. U. Sheep, SE SW NW 25-46n-100w, 7,139 TD, PB 6,488, pmp. 160 BOPD, 40 per cent water, from Tensleep. Frontier 2,465, Muddy 3,620, Dakota 3,800, Lakota 4,100, Morrison 4,165, Sundance 4,350, Phosphoria 6,142, Tensleep 6,365, Amsden 6,605, Madison 6,896.

COLORADO WILDCAT FAILURES

Montrose County, Paradox: American Liberty Oil Co. 1 Govt., C SW SW 10-46n-17w, 10,544 TD, abnd. in Paradox salt formation.

Paradox: W. D. Broadhead 1 Wilcox, SW SW SE 18-47n-18w, 390 TD, suspended indefinitely.

Paradox: Stanford Petroleum 1 Wilcox, CN½ SE 18-47n-18w, 1,090 TD, suspended indefinitely.

Paradox: Stanford Petroleum 1 Oberto, C SW SE 21-48n-19w, 100 TD, suspended indefinitely.

SOUTH LOUISIANA

Texas Co. Opens New Field In Pointe Coupee Parish

NEW ORLEANS — A new oil field in Pointe Coupee Parish has been opened by The Texas Co. 1 Joseph Oscar Long et al, 29-6s-8e, located 1 mile north of Lottie townsite on the Fordoche Prospect. Hole was drilled to a depth of 10,280 ft., and 7-in. casing cemented to 9,795 ft. for tests. On test through perforations 8,286-94 ft., using ⅛-in. choke, the well flowed 147 bbl. of 39°-gravity oil per day with gas-oil ratio 2,790. Gas sands were tested at 8,997-9,003 ft., where well flowed 5,400,000 cu. ft. of gas; and at 8,828-37 ft., where flow was 156 bbl. of 59°-gravity condensate along with 3,761,000 cu. ft. of gas daily. Operators are preparing to make a potential flow test from oil sand at 8,286-8,284 ft.

Humble Oil & Refining Co. 1 Atchafalaya Land Co., 1-15s-11e, 4 miles southwest of West Lake Verret production, in St. Martin Parish, has opened a new oil field. Drilled to a total depth of 12,525 ft., with pipe cemented to 12,488 ft., the well flowed at the rate of 435.5 bbl. of 38.9°-gravity oil per day, through perforations at 11,642-652 ft., using a 14/64-in. choke. Operators continue to test.

Offshore from Plaquemines Parish, in the

Main Pass, Block 69 field, oil production has been confirmed by The California Co. 1 Louisiana State Lease 1277. Oil shows have been reported in levels at 5,556-64 ft., 5,628-46 ft., 5,682-91 ft., 5,768-5,810 ft., 5,961-83 ft., and 6,272-92 ft. The sand perforated for completion is not known, but on an initial test, the well flowed 192 bbl. of 26.4°-gravity oil per day, flowing pressure on tubing 740 psi.

Gravis & Mitchell 1 Opendwer - Alcus Cypress Co., a new oil well for St. Gabriel field, Ascension Parish, flowed almost 500 bbl. of oil daily on potential gage, through perforations at 11,440-55 ft. Total depth is 12,213 ft. Through a 9/64-in. choke, the well kicked off and flowed at the rate of 486 bbl. of 40°-gravity oil per day with flowing pressure on tubing at 4,900 psi. This well is in section 7-9s-2e.

There were 11 new locations for South Louisiana reported this week with 2 wildcat starts included, both in Plaquemines Parish.

MISSISSIPPI

Sandy Hook Field Extended By Union Producing Co.

JACKSON. — Sandy Hook field, Marion County, has been extended approximately 1¼ miles north by Union Producing Co. 2 Pittman, 12-1n-18w. On a production test, using ⅞-in. choke, the well flowed at the rate of 2,430,000 cu. ft. of gas per day with tubing pressure of 3,249 psi., with calculated open flow 32,000,000 cu. ft. per day. No gage or estimate of the amount of condensate was made. Well is shut in waiting on pipe-line connection.

The California Co. 24 Ella G. Lees, 29-7n-1w, in Cranfield field, Adams County, flowed 114 bbl. of 40.2°-gravity oil per day through a 7/64-in. choke, through perforations at 4,748-50 ft. Total depth is 5,759 ft.

Sohio Petroleum Co. A-1 E. D. Ogden, 42-6n-2w, in La Grange field, South, in Adams County, has been completed flowing 120 bbl. of 43.5°-gravity oil per day through a ⅛-in. choke. Total depth is 6,401 ft., with perforations at 6,357-63 ft.

In Langsdale field, Clarke County, Kirby Petroleum Co. C-4 Long Bell Petroleum Co., 30-1n-18e, was completed on pump with initial production of 50 bbl. per day of 19.5°-gravity oil. Total depth is 3,830 ft., and production is through perforations at 3,721-31 ft.

Humble Oil & Refining Co. B-1 R. H. Grenn Unit, 20-6n-8e, in Mallalieu field of Lincoln County, was completed flowing 434 bbl. per day of 37.6°-gravity oil, through 24/64-in. choke. Perforations at 10,449-77 ft., and total depth 10,486 ft.

Also in Mallalieu field, Humble 1 W. R. Hall, 21-6n18e, flowed 303 bbl. of 37.8°-gravity oil per day through perforations at 10,448-58 ft. Total depth is 10,523 ft.

Two wildcat starts were reported this week, one each in Lawrence and Sharkey counties, while only one development location was reported for LaGrange field-South, in Adams County. One successful exploratory test extended production at Sandy Hook field, Marion County, and one wildcat was dry in Franklin County.

MISSISSIPPI SUCCESSFUL WILDCAT

Marion County: Extension to Sandy Hook field—Union Producing Co. 2 Pittman, 12-1n-18w, 1¼ mi. N extension to Sandy Hook field, TD 9,022 ft., gas well, flowed at rate of 2,430,000 cu. ft. gas per day through ⅞-in. choke. Shut in waiting on pipe line.

MISSISSIPPI WILDCAT FAILURE

Franklin County: Wm. Helis 1 R. Lehmann et al, Center NW NW 14-7n-2e, dry, TD 10,794 ft.

FLORIDA WILDCAT FAILURE

Collier County: Humble Oil & Refining Co. 1-C Lee Tidewater Cypress Co.,

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Center NE NW 7-48s-29e, dry, TD 11,893 ft.

EASTERN TEXAS

Stanolind Conditions Hole After Drill-Stem Test

DALLAS.—Stanolind Oil & Gas Co. 1 Tom and Walton Deupree, 5½ miles southeast of Athens in Henderson County, were conditioning hole after running a 2-hour drill-stem test of the Travis Peak. Tested from packer at 11,429 ft. to total depth of 11,728 ft. (corrected), it produced a slight blow at the surface for 10 minutes and recovered the 5,000 ft of water cushion plus 350 ft. of drilling mud with no shows. Flowing bottom-hole pressure was 1,700 psi. Shut-in pressure was not recorded.

In Kaufman County, 4 miles southeast of Kemp, Humble Oil & Refining Co. 1 E. N. Rylie reached total depth of 6,340 ft. in shale and lime and shut down for gas.

Humble Oil & Refining Co. 1 J. W. Minton, Pettit wildcat in Sabine County, 9 miles northeast of Hemphill, had total depth at 4,600 ft. in ashy sand and prepared to run electrical surveys. It was drilled to 4,560 ft., then cored on down to total depth. At 4,580-90 ft., the bottom foot was ashy, slightly porous sand with slight odor and light, uneven brown stains. Four feet of recovery from 4,590--95 ft. was 1 ft. of sand the same as above, and 3 ft. of greenish-gray, fine-grained and slightly porous ashy sand, with no shows.

In Van Zandt County, J. Sparks Survey, A-826, B. G. Byars 1 Lawrence Parker had total depth at 6,433 ft., then plugged back to 3,850 ft. and perforated the sub-Clarksville at 3,737-43 and 3,754-60 ft. After running tubing it swabbed mud with a slight show of gas and a trace of oil. Tubing was pulled and bailing yielded mud with a trace of oil.

CALIFORNIA

San Ardo Area Gets Another Discovery

LOS ANGELES.—The Texas Co. has made another oil discovery in the San Ardo area of Monterey County with its 4 Aurignac NCT-1, 4-23s-10e, which was placed on pump last week for an initial production of 60 bbl. daily. Gravity of the oil in the new field is 11°, and initial production of the discovery well contained a water cut of 20 per cent. Production is through perforated liner which was landed opposite the entire interval 2,611-2,750 ft. The well was drilled to a total depth of 2,780 ft. and plugged back to 2,750 ft.

The Texas Co.'s new find is the third field for Monterey County and is located about 1½ miles southwest of the company's Lombardi (San Ardo) field. The other producing field in the county is the Jergins Oil Co. production north of Lombardi. Jergins has staked a wildcat location for the 1 Garrissere, 28-22s-10e, which is approximately 1¾ miles north of the new discovery.

A second new discovery in California during the past week was the opening of a new fault block in the Cat canyon field of Santa Barbara County by the Sunray Oil Corp. Sunray has announced that it has placed its 2 Dominion, 23-9n-33w, on pump for an estimated production of 240 bbl. daily. Gravity of the oil was reported to be 10°, and water cut approximately 6 per cent. Total depth of the well is 6,686 ft. Production is coming from a chert zone at the interval 6,393-6,686 ft. Sunray holds 270 acres in the area, and has staked location for a follow-up well.

Chanslor-Canfield-Midway Oil Co. at the close of the week was continuing to drill ahead near the 9,900-ft. level in its deep wildcat in the Rincon field of Ventura County. The venture, B-100 Hobson, 16-3n-24w, is scheduled to go to about 11,000 ft. It has been reported that the well has already encountered oil saturated sands below currently producing zones in the field.

CALIFORNIA SUCCESSFUL WILDCATS

Kern County, Edison area: Beloil Corp., Ltd., 45-26-1 Lawson-Bennett, 26-30s-29e, flowed 210 bbl. daily through 16/64-in. choke, gravity 28.5°, water cut 0.1 per cent, elev. 585 ft., TD 2,958 ft.

Monterey County, San Ardo area: The Texas Co. 4 Aurignac NCT-1, 4-23s-10e, pumped 60 bbl. daily, gravity 11°, water cut 20 per cent, perf. liner 2,611-2,750 ft., elev. 853 ft., TD 2,780 ft.

CALIFORNIA WILDCAT FAILURES

Kern County, Tejon area: Steele Petroleum Co. 1 Roco, 15-11n-18w, dry, elev. 1,030 ft., TD 888 ft.

Los Angeles County, Long Beach area: General Petroleum Corp. 1 Los Cerritos, 13-4s-13w, dry, elev. 45 ft., TD 11,493 ft.

Santa Barbara County, Cuyama Valley area: Richfield Oil Corp. 137-5 Russell A, 5-10n-27w, dry, elev. 2,130 ft., TD 1,538 ft.

Monterey County, Parkfield area: Slayton Drilling Co. 88 Colgrove-Taylor, 15-23s-14s, dry, elev. 1,560 ft., TD 4,986 ft.

San Luis Obispo County, Carrizo Plains area: Union Oil Co. 1 Wreden, 17-29s-17e, dry, elev. 2,070 ft., TD 5,722 ft.

Yolo County, Dunnigan Hills area: Standard Oil Co. of California 1 Hufford, 18-12n-1w, dry, elev. 250 ft., TD 3,254 ft.

KANSAS

Barton County Wildcat Pumps 10 Bbl. Per Hour

THE Barton County wildcat, Mouser Drilling Co. 1 Fransen, NW SE NW 6-20s-12w, is making a good oil well. On tests, the well pumped 10 bbl. of oil per hour from the Lansing through perforations at 3,176-89 ft. The top of the Lansing was called at 3,162 ft. and hole was drilled to 3,461 ft., 9 ft. in the Arbuckle. The oil is 45.5° gravity.

Sam K. Pack and Braden & Green 1 Griebel, NE NE NW 8-7s-19w, Rooks County wildcat, swabbed at the rate of 14 bbl. per hour on a 14-hour test following treatment with 2,000 gal. of acid. Production is from the Arbuckle with the top of the formation called at 3,438 ft. and the hole drilled to 3,456 ft. The same operators have staked a wildcat, 1 Smith, NW NW NW 20-7s-22w, Graham County.

The area south of Zurich Townsite pool in Rooks County has new Arbuckle production at W. L. Hartman 1 Webster, SW SW SE 34-9s-19w, where the crew swabbed 35 bbl. of oil in 5½ hours. Top of the formation was called at 3,640 ft. and total depth is 3,656 ft. The pay was treated with 2,500 gal. of acid.

Petroleum, Inc., has a probable extension south and west of McHale pool in Rooks County at 1 Ruzicka, NW NW SW 17-9s-18w, Operator has set casing 1 ft. in the Arbuckle, called at 3,614 ft., with the hole drilled to a total depth of 3,619 ft.

Robert L. Williams is testing the Lansing-Kansas City through perforations at the Stafford County wildcat, 1 Pritchard, NE NE NE 22-22s-14w, after finding water in the Arbuckle. The Lansing was cut at 3,456 ft. and the Arbuckle at 3,837 ft. Total depth was 3,850 ft.

New locations announced for the week amounted to 31. Rice County led with five while Barton, Butler, and Russell reported four each.

KANSAS SUCCESSFUL WILDCAT

Russell County: Skelly Oil Co. 1 Parker "A," SE SE NW 18-15s-12w, pumped 23 bbl. of 36°-gravity oil per day from Arbuckle at 3,260-70 ft.; anhydrite 756 ft., Lansing 2,988 ft., TD 3,270 ft.

KANSAS WILDCAT FAILURES

Barton County: Amerada Petroleum Corp. 1 Finger, NW NW NE 34-17s-14w, dry, TD 3,439 ft., anhydrite 810 ft., Topeka 2,816 ft., Lansing 3,118 ft., conglomerate 3,321 ft., Arbuckle 3,356 ft.

Butler County: Dunne & Strait 1 Parks, NW NW NW 36-29s-4e, dry, TD 2,890 ft., Kansas City 2,240 ft., Mississippian 2,885 ft.

Cowley County: W. L. Hartman 1 Meyer, NW NE NE 20-30s-5e, dry, TD 3,418 ft. Kansas City 2,280 ft., Missississpian 2,931 ft., Layton 2,043 ft., Oswego 2,603 ft., Bartlesville 2,922 ft., basal Mississippian 3,257 ft., Kinderhook 3,275 ft., Arbuckle 3,399 ft.

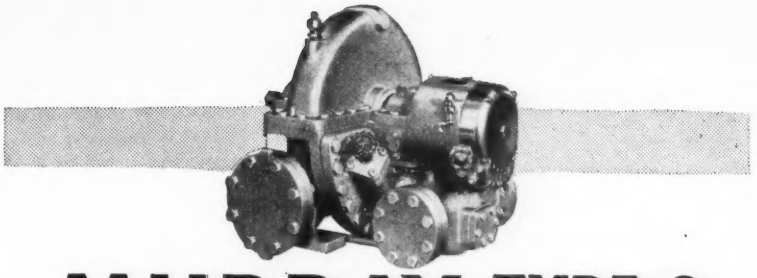
Wakefield et al 1 Kemper, NE SE SW 14-34s-4e, dry, TD 3,219 ft., Stalnaker 1,940 ft., Mississippi 3,174 ft.

Ellis County: Petroleum, Inc., 1 Harman, NE NE NW 6-12s-18w, dry, TD 3,755 ft., anhydrite 1,455 ft., Topeka 3,160 ft., Heebner 3,373 ft., Dodge 3,392 ft., Lansing 3,417 ft., cherty conglomerate 3,707 ft., Arbuckle 3,725 ft.

Brunson Drilling Co. 1 Dreiling, SE SE NW 9-13s-18w, dry, TD 3,886 ft., anhydrite 1,472 ft., Heebner 3,436 ft., Dodge 3,462 ft., Lansing 3,488 ft., conglomerate 3,748 ft., Arbuckle 3,874 ft.

Nemaha County: Carter Oil Co. 1 Kesler, NW NW NE 14-1s-14e, dry, TD 2,773 ft., Kansas City 1,141 ft., Cherokee 1,701 ft., Mississippian 2,336 ft., Kinderhook 2,446 ft., Hunton 2,677 ft.

Pratt County: Allison 1 Leroux, NE NE SE 17-26s-11w, dry, TD 4,468 ft., Ft. Riley



MURRAY *TYPE-S*

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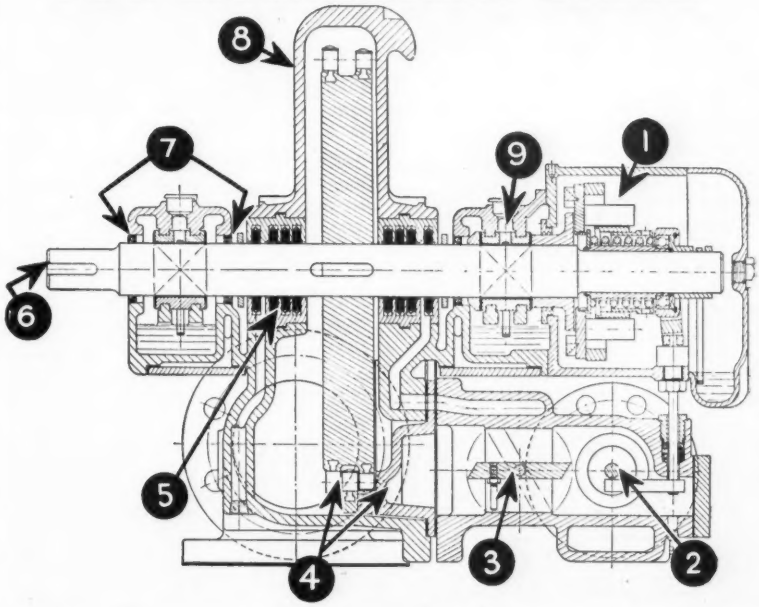

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Reno County: Austerman et al 1 Cooper, NW NW NE 29-24s-9w, dry, TD 4,316 ft., Kansas City 3,368 ft., Mississippian 3,854 ft., Viola 4,115 ft., Simpson 4,173 ft., Arbuckle 4,273 ft.

LA.-ARK.

Deep Failure Responds To Reverse Circulation

SHREVEPORT.—Barnsdall Oil Co. 1 Robert Sykes, deep failure 2 miles east of the Shongaloo field in 1-22n-9w, Webster Parish, was testing after recovering some 40°-gravity oil by reverse circulation. Total depth was 11,592 ft., in the Smackover, plugged back to the Pettit at 5,717 ft. Operators ran a 12-hour drill-stem test of perforations at 5,654-98 ft., then reversed circulation which recovered 10 bbl. of oil. An acid treatment of 5,000 gal. resulted in a flow of oil and acid water into pits.

New perforations at Placid Oil Co. 1 Bienville Lumber Co., 9-14n-7w, Bienville Parish, resulted in an increased gas flow. Previous tests at 7,626-32 ft. gaged about 1,000,000 cu. ft. of gas daily through 3/8-in. choke. New holes from 7,480-88 and 7,414-24 ft. produced an estimated 4,000,000 cu. ft. of gas daily through 1/4-in. choke. It was waiting on gage. One mile to the northeast, Placid 3-B Nebo Oil Co., 3-14n-7w, spudded and was drilling below 4,010 ft. in the upper Cretaceous.

Two new wildcats were ddrilling in Bossier Parish. Four miles south of the Sarepta field, Barnsdall Oil Co. 1 Ardis & Co., 27-22n-1w, was below 1,834 ft. on an 8,200-ft. Cotton Valley contract. Five miles southeast of Bossier City, B. G. Byars 1 H. L. Skannal, 36-17n-13w, was in the lower Glen Rose at 5,702 ft. The latter is a Pettit test.

In Caddo Parish, Phillips Petroleum Co. 1 C. Ellerbe, 17-15n-12w, was drilling in the Travis Peak at 7,880 ft. Phillips 1 Hammack, 6-18n-16w, Longwood field, completed for 159 bbl. of distillate and 3,000,000 cu. ft. of gas daily, flowing through 1/4-in. choke from perforations in the "D" sand of the Cotton Valley at 8,162-8,210 ft. Tubing pressure was 2,300 psi.

Hunt Oil Co. 1 Peevy, 32-15n-3w, Jackson Parish, drilled ahead below 9,918 ft. in the lower Glen Rose after drill-stem testing from 9,582-9,610 ft. Using 5,000 ft. of water blanket, and open 45 minutes, it produced a slight blow and recovered the water blanket plus 1,080 ft. of gas-cut mud.

Southwest Gas Producing Co. 1 W. I. Burgess, 8-20n-4w, Lincoln Parish, was drilling below 8,016 ft. in the Travis Peak. The California Co. 1 Brown Paper Mill, 10-16n-3e, Ouachita Parish, cored sand with slight gas-distillate odor and taste from 7,920-28 ft. A drill-stem test of the section recovered 180 ft. of gas-cut mud. It was drilling ahead below 8,060 ft.

NORTH LOUISIANA WILDCAT FAILURES

Union Parish: T. L. James & Co. 2 Ida Mae Wade, 7-22n-1w, dry, TD 6,611 ft., Travis Peak 4,050 ft., Cotton Valley 6,153 ft., elev. 178 ft.

Winn Parish: W. W. Hawkins 1 Tremont Lumber Co., NE SE SE 33-12n-2w, dry, TD 1,206 ft., Wilcox 1,174 ft., elev. 172 ft. estimated.

L. C. Stevens, Inc., 1 Tremont Lumber Co., 24-12n-2w, dry, TD 1,164 ft., Wilcox 1,154 ft., elev. 211 ft.

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OHIO, KENTUCKY

Large Gas Well Completed In Medina County, Ohio

COLUMBUS. — Ditch & Gerig 1 P. T Webster, Lot 84, Harrisville Township, Medina County, was completed with two small pays and one big pay to make it the largest gas well completed in the state in over a year. The first pay at 2,609 ft. was in the lime, the second was in the upper Clinton at 2,702-03 ft., and the third in the lower Clinton at 2,740-56 ft. Total gas gaged 8,860,000 cu. ft. natural with a rock of 935 lb.

Chartiers Oil 1 J. T. Leach, a wildcat in Section 20, Highland Township, Muskingum County, will make only a small pumper and leaves the company undecided as to further drilling on their large block of acreage. Clinton sand at 4,520-68 ft. showed 100,000 cu. ft. gas natural and 1,200 ft. of high-grade oil and no gas in 5 days after a 120-qt. shot.

Four Way Oil & Gas Co.'s offset to the Hamilton on E. L. Swinehart, Section 26, Hopewell Township, Perry County, made 600,000 cu. ft. gas with only a small showing of oil natural. After a 90-qt. shot, the shut-in gage was 1,125,000 cu. ft. with no increase in the oil.

New locations were down to a low point with 11 reported from 7 counties. Ashland and Muskingum had three each and five other counties one each. Completions were also off with 15 for the week. Ashland field had five and Cambridge three.

EASTERN KENTUCKY

ASHLAND.—Shut down over the holidays drilling is about to be resumed on Jack Kindreds' 1 C. J. Sipple, located in 19-N-69, western Bee County. Operators are now bottomed in the St. Peter sand at a total depth of 2,957 ft. with the Knox dolomite objective expected soon.

In southern Fleming County, Edward Lillie et al is testing show of oil in the Knox dolomite. Operators reported show of oil from 2,120-32 ft., total depth, and had run 2-in. casing with side-wall packer to point above pay in order to shut off upper formation water. At last report swabbing through tubing was in progress.

In western Powell County and on a seismic prospect, Arch Carpenter et al 1 James Hall, 23-P-67, was drilling at 3,150 ft. in Knox dolomite with water in the hole. Formation tops have as yet not been released on this test.

Further south but in Estill County, same operators were drilling at 2,875 ft. on 1 Pete Wells, another Knox dolomite test for the general area.

INDIANA

EVANSVILLE. — The area southwest of Mount Vernon has another prospective pool opener at Ashland Oil & Refining Co. and Coy Oil Co. 1 William Cullinan, NW SE SW 23-7s-14w, Posey County. The well is on pump test of the McClosky with production through perforations at 2,650-68 and 2,724-28 ft. The zone was treated with 2,000 gal. of acid and the well pumped 64 bbl in 12 hours. Another good discovery well was completed south of this area in November to open Spencer pool and cause a swing in drilling interest to the southern part of the county during the closing months of last year.

In Daviess County, Coy Oil Co. 1 Cecil V. Wildman, SE SW SE 21-2n-7w, was clearing out after a 64-qt. shot in the Rosiclare for further tests of that formation. This well failed to find oil in the Devonian.

On the eastern edge of College pool, Basin Drilling Co. has completed 1 Oakland City College, NW NE SE 16-8s-14w, with an initial production of 30 bbl. per day from the Waltersburg at 1,852-56 ft.

INDIANA WILDCAT FAILURES

Knox County: M. L. Curtner 1 M. L. and V. Curtner, NW NW SW 20-2n-10w, dry, TD 1,629 ft.

Posey County: Joel Vail 1 W. E. Hill, NW NE SW 18-7s-12w, dry, TD 2,775 ft.

Sullivan County: F. B. Cline 1 Robert Crowder, SE SW SW 3-7n-9w, dry, TD 2,496 ft.

Vanderburgh County: G. E. Baldwin 1 H. E. Boyle, NW NW SE 32-4s-10w, dry, TD 2,400 ft.

WESTERN KENTUCKY

OWENSBORO.—F. M. Ashby has another oil well in the Stanley area of Daviess County. Operator is pump testing 2 St. Peter Catholic Church, 5-P-28, with production from the Palestine at 971-84 ft. reported to be 150 bbl. per day. The same operator is cleaning out after a 20-qt. shot at 1 J. A. Alvey, 5-P-28, after plugging back to 987 ft. in the Palestine.

Delta Drilling Co. and Aurora Gasoline Co. have completed 1 W. J. Mills, 14-O-23, in the town of Cairo, Henderson County. The well made 56 bbl. per day on pump from the Waltersburg at 1,783-92 ft. after a 30-qt. shot.

WESTERN KENTUCKY WILDCAT FAILURE

Daviess County: A. V. Smith 1 E. Waitman, 6-P-29, dry, TD 1,320 ft.

PERMIAN BASIN

Magnolia Gets Discovery Well in Scurry County

MIDLAND.—Magnolia Petroleum Co. was in line for another Pennsylvanian discovery in Scurry County, at its 1 H. G. Moore, 3 miles southwest of Snyder, and 1½ miles north and ½ mile west of the same company's 1 Winston which made a 67-bbl. pumper from the Pennsylvanian at 7,429-32 ft. The new well flowed oil on a drill-stem test at 6,865-85 ft., making an estimated 30 bbl. of 39.4°-gravity oil an hour into pits. The tool was open 15 minutes on the test; sweet gas showed at the surface in 3½ minutes, oil-cut mud in 9 minutes and flowing oil in 11 minutes. The flow was through ½-in. choke. The pay section has been tentatively identified as the Canyon lime. Operators were to set casing on bottom after making electrical surveys. Location is 660 ft. from south and west lines of Section 207, Block 97, H&TC Survey.

Two new wells for the Bronte field of Coke County were in prospect after flowing oil on drill-stem tests. In Section 453, Block 1-A, H&TC Survey, Humble Oil & Refining Co. 1 Hickman ran a 30-minute test on the Palo Pinto at 4,339-90 ft. Gas surfaced in 3 minutes, followed by mud in 8 minutes and oil at 9 minutes. Flowing through ⅝-in. choke, the well made 21 bbl. of clean oil in 15 minutes, and 27 bbl. of oil the next 15 minutes. Casing was to be run on top of the pay.

Hickok Reynolds, Inc., 1 McQueen, Section 450, Block 1-A, H&TC Survey, was allowed to flow into pits for 1 hour but no estimate was made on the amount of flow.

The section tested was 4,349-4,408 ft.

In Gaines County, The Texas Co. 1-B Wharton, Section 3, Block A-22, PSL Survey, recovered oil on two drill-stem tests of the Glorietta lime. First test, from 5,920-60 ft., open 5 hours, recovered 90 ft. of oil and 350 ft. of oil and gas-cut mud. Oil tested 32° gravity. A second test, open 4 hours, was made from 5,940 to 6,000 ft., total depth, which recovered 880 ft. of oil and 270 ft. of oil and gas-cut mud. Operators were awaiting orders. The new prospector, originally drilled to 5,080 ft. by Anderson-Prichard Oil Corp., is 2¾ miles east and slightly south of Clear Fork production in the Robertson field.

Tex Harvey Oil Co. 1 L. B. Floyd, Midland County wildcat, pefforated the Pennsylvanian from 10,205-25, 10,338-44, 10,395-10,420 and 10,445-65 ft. It was to be swabbed natural, then acidize and continue testing. This well was dry in the Ellenburger at total depth of 12,053 ft., but recovered 47 bbl. of 39°-gravity oil in swabbing the Permian at 7,865-75 and 8,045-55 ft.

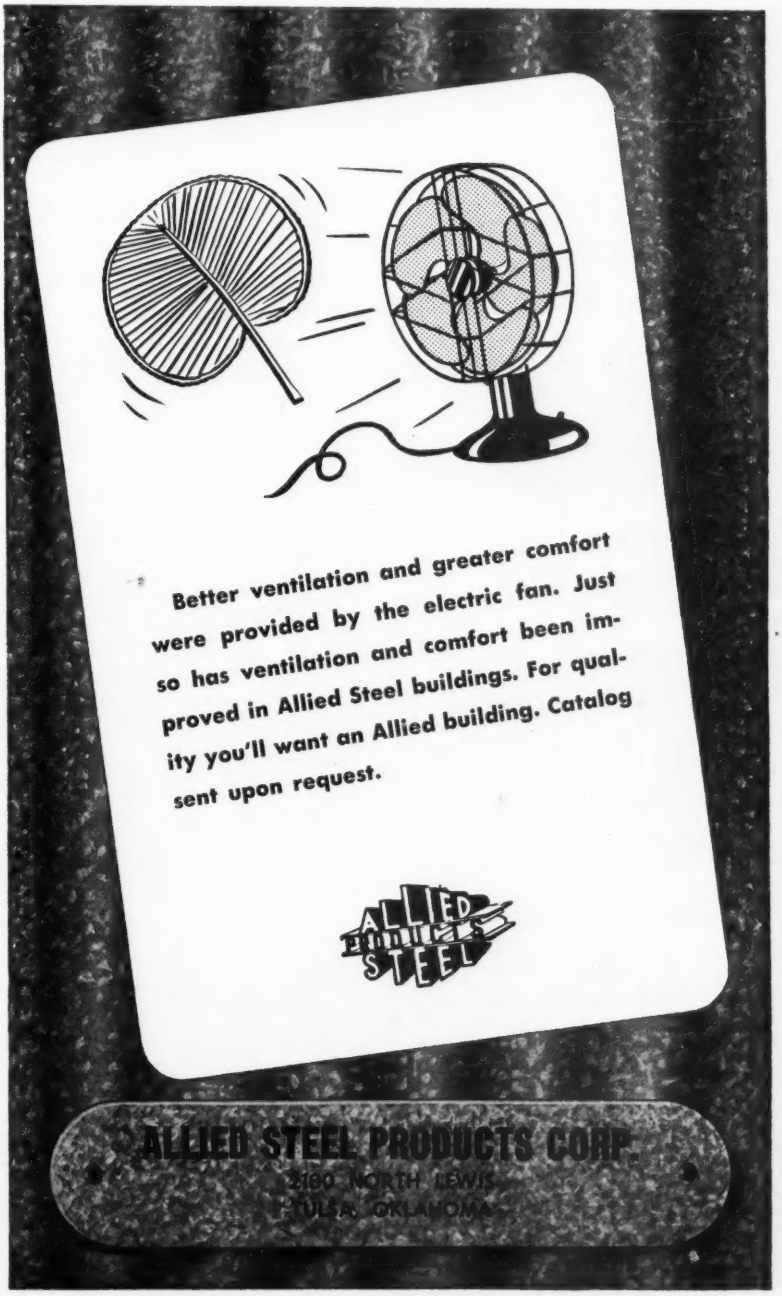
Unnofficial reports indicated a deeper pay for the southwest side of the Wasson San Andres field, Yoakum County, at Denver Producing & Refining Co. 17-C Elliott. According to reports, a 2-hour drill-stem test in the Devonian at 9,670-9,716 ft. recovered 30 ft. of 30°-gravity oil, plus 700 ft. of oil-cut drilling mud. It drilled ahead to 9,767 ft. and prepared to make another test. Tentative top on the formation was 9,670 ft., on an elevation of 3,618 ft. It is said to be high to other deep tests in the area. Location of the well is 1,312 ft. from south and 1,070 ft. from east lines of Section 832, Block D, John H. Gibson Survey.

WEST TEXAS (DISTRICTS 8 & 7-C) SUCCESSFUL WILDCAT

Schleicher County: Skelly Oil Co. 1 Mary L. Jackson, 1,650 ft. from N, 2,310 ft. from W lines, Sec. 41, Blk. LL, TC Sur., approximately 3 mi. NW Eldorado in abandoned Opp area, Pennsylvanian 4,072-4,109 ft., TD, flowed 102 bbl. 32°-gravity oil in 11 hours and 50 minutes, ½-in. choke, GOR 540 cu. ft., elev. 2,376 ft.

WEST TEXAS (DISTRICTS 8 & 7-C) WILDCAT FAILURES

Hockley County: Amerada Petroleum Corp. 1 Griffith & Lawhorn, Labor 5, League 730, CSL Sur., 6 mi. N Levelland, dry, TD 7,761 ft., San Andres 3,750 ft., elev. 3,550 ft.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Sterling County: Amerada Petroleum Corp. 1-E TXL, Sec. 37, Blk. 32, T&P Sur., dry, TD 9,800 ft., Clear Fork 2,800 ft., Wichita Albany 4,160 ft., Wolfcamp 5,010 ft., elev. 2,687 ft.

SOUTHEASTERN NEW MEXICO

HOBBS.—Amerada Petroleum Corp. 1-B-T-A State, 12,000-ft. wildcat in 2-12s-33e, Lea County, stopped to drill-stem test at 4,363-4,428 ft. Recovery after 80 minutes was 20 ft. of drilling mud with no shows. A second test of the same duration at 4,427-96 ft. recovered 230 ft. of drilling mud and 705 ft. of sulfur water. It topped the San Andres at 3,770 ft., on an elevation of 4,235 ft.

Amerada's 1-C-N-A State in 33-15s-32e, was nearing contract depth of 5,000 ft. with no shows reported. A drill-stem test at 4,829-4,912 ft., open 68 minutes, yielded 90 ft. of drilling mud with no shows. Amerada's 1 J. R. Hamilton, 35-16s-38e, recovered 180 ft. of drilling mud and 8,385 ft. of sulfur water on a 2-hour and 48-minute test at 9,666-9,760 ft. Drilling continued below 9,850 ft. in lime.

Phillips Petroleum Co. 1 Shipp, 20-18s-37e, ran a 1-hour test from 8,661-8,745 ft., recovering 50 ft. of drilling mud and 2,400 ft. of sulfur water. It continued drilling below 8,935 ft. According to reports, the well is 100 ft. lower than Amerada's Clearfork discovery in 1-20s-36e. The 1 Shipp has an elevation of 3,747 ft., and had a tentative top on the Clearfork at 5,945 ft.

Stanolind Oil & Gas Co. 1-U State, 2-20s-38e, had 4,000 ft. of fluid standing in the hole and was preparing to swab, after plugging back from 10,014 to 7,149 ft.

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N. CENTRAL TEXAS

Shackelford County Well Will Test Hickory Sand

WICHITA FALLS.—In southeastern Wise County, 4 miles southwest of Boyd, J. M. Hickey and Texzona Producing Co. 1 Birdwell, B. Jones Survey, reported a show of gas, but not oil, in the Bend conglomerate. Operators continued swabbing from perforations at 5,444-64 and 5,475-84 ft. Northwest of Boyd, Hickey & Sons 1 Hickey, Block 83, Van Zandt County School Lands Survey, was trying to restore circulation at 4,606 ft. Two miles south of Paradise, Mid-Continent Petroleum Corp. 1 McBride, W. Burke Survey, was drilling below 2,650 ft.

In Shackelford County, Honolulu Oil Corp. 1 Floyd C. Pool, Ellenburger prospect on the west edge of Moran, planned to continue drilling to explore the Hickory sand of Cambridge age. It is said to be the first such test in the county. The well indicated production from the Ellenburger of from 50-100 bbl. a day, from top at 4,050 ft., to 4,150 ft., total depth. Location is in Section 35, University Lands Survey.

Other Shackelford County exploration work included: H. F. Pettigrew 1 T. E. Moore, Section 1,560, TE&L Survey, 1 mile southeast of the McElroy Ranch Co. field, which was drilling ahead below 3,877 ft. It is an Ellenburger test. Nine miles west of Albany, G. E. Kadane & Sons 1-A Merrick Davis, Section 23, Block 12, T&P Survey, was drilling at 3,177 ft. Five miles northeast of Albany, Twin Oil Corp. 1 L. A. Sanders, Section 594, TE&L Survey, was held up by a fishing job at 2,957 ft. It is an Ellenburger wildcat. Three miles south of Albany, Oil Well Drilling Co. and W. J. Weaver 1 W. C. Godwin-Humble, Section 18, BAL Survey, was below 3,000 ft. Seven miles southeast of Albany, F. N. Palm 3 Valina Palm extended shallow sand production southeast of the discovery well when it flowed 27 bbl. of oil in 12 hours, through ½-in. choke, from sand pay at 406-418 ft. Location is Section 67, LAL Survey.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) SUCCESSFUL WILDCATS

Jones County: S. C. Herring 1 Effie Anderson, Sec. 2, MEP&PRR Sur., 6 mi. W Anson, flowed 120 bbl. 38°-gravity oil a day, 10/64-in. choke, Flippen 2,622-54 ft., TP 80 psi., GOR 225 cu. ft., elev. 1,1916 ft.

T. D. Humphrey 1 C. R. Foster, Sec. 26, D&DA Sur., 2 mi. SW Avoca, flowed 96 bbl. 38°-gravity oil a day, 12/64-in. choke, sand 2,126-31 ft., TD, TP 100 psi., GOR 300 cu. ft., elev. 1,580 ft.

Robinson Puckett, Inc., 1 Goodwin-Baker, Sec. 52, D&DA Sur., 2½ mi. NE Anson, flowed 98 bbl. 42°-gravity oil a day, ½-in. choke, sand 3,573-97 ft., TD 3,635 ft., PB 3,597 ft., TP 40 psi., GOR 335 cu. ft., elev. 1,655 ft.

Montague County: Continental Oil Co. 1 H. A. Richardson, Blk. 79, Titus CSL, 7 mi. SE Bowie, flowed 125 bbl. 42°-gravity oil in 3 hours, ½-in. choke, conglomerate 6,054-73 ft., TD 6,570 ft., CP 550 psi., TP 125 psi., GOR 700 cu. ft.

Shackelford County: McElroy Ranch Co. 1 Danis-Crow, Sec. 1, Blk. 11, T&P Sur., 7 mi. E Albany, flowed 145 bbl. 44°-gravity oil and 370 bbl. salt water a day, Marble Falls 4,543-59 ft., TD 11/64-in. choke, TP 180 psi., GOR 505 cu. ft.

James H. Snowden 1 R. A. Elliott, Sec. 26, OAL Sur., 4 mi. NE Moran, flowed 69 bbl. 43.8°-gravity oil a day, ¾-in. choke, pay 4,319-20 ft., TD.

Throckmorton County: Humble Oil & Refining Co. 3 Kirk Ledbetter, Sec. 2, W. S. Riddle Sur., CEL, flowed 214.4 bbl. 41°-gravity oil 3½ hours, 12/64-in. choke, Caddo 4,549-66 ft., TD, CP 480 psi., GOR 830 cu. ft., elev. 1,416 ft.

Woodley Petroleum Co. 1 J. L. Edens, Sec. 689, TE&L Sur., 2½ mi. W Woodson, pumped 40½ bbl. 41°-gravity oil a day, Mississippian 4,567-74 ft., TD.

Hunter Bros. 1 Emma Wiechman, Sec. 173, TE&L Sur., 2 mi. NW Olney, flowed 216 bbl. 41°-gravity oil a day, 16/64-in. choke, Caddo 4,332-55 ft., TD 4,370 ft., PB 4,366 ft., TP 400 psi., GOR 450 cu. ft., elev. 1,239 ft.

R. C. Lipscomb 1 Furr & Allar, Sec. 316, TE&L Sur., 5 mi. SW Olney, flowed 172,8 bbl. 42°-gravity oil in 16 hours, 14/64-in. choke, Chappell lime 4,758-70 ft., TD, CP 750 psi., TP 530 psi., GOR 400 cu. ft., elev. 1,322 ft.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) WILDCAT FAILURES

Archer County: Akin & Dimock 1 Norton Properties, Sec. 1, BS&F Sur., 4 mi. SW Anarene, dry, TD 5,270 ft., Caddo 4,683 ft., Missiissippian 5,222 ft.

Cato Oil Co. 1 Schroeder, Sec. 2, SPRR Sur., 10 mi. S Wichita Falls, dry, TD 5,273 ft., Caddo 5,255 ft.

J. J. Lynn 1 E. A. Hoff, Lot 39, Blk. 5, Clark & Plumb, 4 mi. SE Archer City, dry, TD 4,200 ft.

W. J. & J. J. Moran 1 W. R. Hammond, H. Corzine Sur. A-56, 4 mi. SW Scotland, dry, TD 5,819 ft., Caddo 5,120 ft., Ellenburger 5,713 ft.

Scott Bros. 1 J. H. Turbeville, Blk. 68, Jefferson CSL, 5 mi. SE Archer City, dry, TD 3,308 ft.

Baylor County: C. Y. Gorman 1 E. W. Skelly, Sec. 2457, TE&L Sur., 2 mi. NW Megargel, dry, TD 1,567 ft. in shale.

Brown County: J. E. Fitzpatrick 1 West Bros., Sec. 501, J. C. Wofford Sur., 4 mi. SW Grosvenor, dry, TD 1,550 ft.

Cooke County: J. R. & Adam Seitz 1 V. L. Parker, Anthony Livingston Sur., 5 mi. E Woodbine, dry, TD 5,030 ft., no tops reported.

Fred Snuggs 1 J. P. Honeycutt, A. M. Williams Sur., 10 mi. NE Gainesville, dry, TD 5,856 ft., sand 5,269 ft., lime 5,711 ft.

Erath County: Continental Oil Co. 1 J. J. Bennett, W. B. Whitaker Sur., 4 mi. E Lingleville, strat test, dry, TD 6,069 ft., Barnett 3,997 ft., Ellenburger 4,118 ft., pre-Cambrian 6,046 ft., elev. 1,416 ft., Ellenburger carried light stain and odor, yielded mud on DST.

Fisher County: Kerr McGee Oil Industries 1 Dera, Sec. 55, Blk. 2, H&TC Sur., 5 mi. SW Rotan, dry, TD 6,971 ft., Dotham 3,600 ft., Noodle Creek 3,680 ft., Saddle Creek 3,805 ft., Swastika 4,248 ft., Caddo 6,262 ft., Mississippian 6,571 ft., Ellenburger 6,815 ft., elev. 2,082 ft.

Jones County: Iowa Payne Drilling Co. 1 F. B. Kelson, Lot 70, Lge. 126, DeWitt CSL, 2 mi. NE Smith, dry, TD 2,803 ft., Dotham 1,780 ft.

Sohio Petroleum Co. 1 F. B. Cowan, Sec. 179, BBB&CRR Sur., 3 mi. NW Lueders, dry, TD 4,286 ft., Flippen 1,760 ft., Strawn sand 4,070-4,286 ft., elev. 1,577 ft.

Ungren & Frazier 1 J. R. Cook, Sec. 212, Wm. S. Coulson Sur., 12 mi. SW Avoca, dry, TD 3,350 ft.

Montague County: Daniel Peterkin, Jr., 1 Watson Heirs, W. Watson Sur., 3 mi. SW Belcherville, dry, TD 4,126 ft.

G. J. Scholl & J. D. Richey 1 L. W. Howard, Blk. 8, Kaufman CSL, 5 mi. NE Nocona, dry, TD 1,800 ft.

Shackelford County: Max Eversborg 1 C. B. Snyder, Sec. 24, LAL Sur., 10 mi. SE Albany, dry, TD 4,357 ft., Caddo 3,553 ft., Ellenburger 4,334 ft., elev. 1,376 ft.

Stephens County: Andrews & Associates 1 R. Corbett "A," R. Campbell Sur., 3 mi. S South Bend, dry, TD 4,131 ft., Caddo 3,355 ft., Ellenburger 4,126 ft., elev. 1,128 ft.

Stonewall County: Paul Moss 1 Lee & Wayman Smith, Sec. 127, Blk. D, H&TC Sur., 3½ mi. S Aspermont, dry, TD 6,366 ft., Palo Pinto 5,072 ft., Ellenburger 6,288 ft., elev. 1,822 ft.

Young County: C. V. Mangram 1 J. K. Jeffery, Sec. 198, TE&L Sur., 6 mi. SW Olney, dry, TD 764 ft.

F. J. Weddell 1 W. T. Rogers, Sec. 222, TE&L Sur., 2 mi. SE Olney, dry, TD 962 ft.

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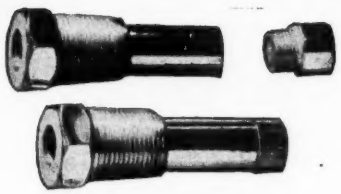

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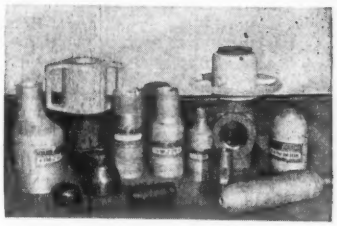

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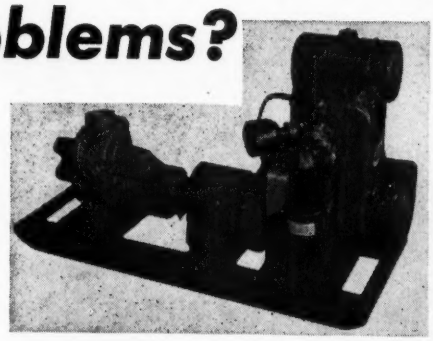
Winter Oil Treating Problems?



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CANADIAN FIELDS

Redwater Operations Continue Active

CALGARY.—Canada's two leading independent oil producers, Anglo Canadian Oil Co. and Home Oil Co., confirmed successes at Redwater wells when drill-setm tests brought a flow of oil to the surface in 21 to 27 minutes. The Anglo-Home Redwater 1, LSD 16, 36-57-22w4, is now running liner preparatory to placing on production. Anglo-Home 2, LSD 15, 36-57-22w4, has set liner and will likely be placed on production during the next few days.

The third drill-stem test at Redwater 1, from 3,226-57 ft., brought a gas flow to the surface in 4 minutes, with oil flow hitting the surface in 24 minutes. Second test, of interval 3,195-3,225 ft., gave a rise of 2,925 ft. of gassy oil in 1 hour. First test, from 3,154-95 ft., brought oil to top of the pipe in 1 hour. D3 zone was contacted at 3,125 ft., with porosity showing at 3,155 ft. At total depth of 3,257 ft., 102 ft. of oil-bearing pay in open. A liner is being set from base of 7-in. casing at 2,849 ft. to top of D3, then plug will be drilled and the well placed on production.

First drill-stem test at Redwater 2 was from 3,189-3,230 ft. with a flow of oil reaching the surface in 27 minutes, and a maximum natural gas flow rate of 50,000 cu. ft. daily. Second test, of interval 3,230-50 ft., gave a small flow of gas, with flow of oil hitting the surface in 21 minutes. D3 zone was contacted at 3,173 ft., with porosity showing at 3,193 ft. Redwater 1 completed at 3,270 ft. with 77 ft. of oil pay showing. A liner has been set from base of 7-in. casing at 2,912 ft. to top of D3, and the well will be placed on production in the next few days.

Favorable indications are shown at the P. S. & P. Redwater 1, joint venture of Pacific Petroleums, Ltd., Sunray Oil Co., Calvan Petroleums, Ltd., and Princess Petroleums, Ltd. The well, located in LSD 13, 36-57-22w4, about ½ mile west of Anglo-Home 2, is expected to enter D3 pay zone around 3,200 ft. According to official log released by the company officials, the D2 zone was topped about 2,950 ft., compared with a D2 top of around 2,960 ft. at Anglo-Home Redwater 2, ½ mile to the east. KB elevation of P. S. & P. 1 is 2,052 ft., compared with 2,049 ft. at Anglo-Home 2. Thus, Pacific and partners not only appear assured of oil success but also have indicated an important extension of Redwater oil reserve.

Gibbons-Bruderheim.—Two new wildcats have been staked about 12 miles apart near Gibbons and Bruderheim, to test the lower Cretaceous and Devonian. The new ventures join one already under way in the search for oil within a 10-mile radius of the southerly portion of the Redwater proven area. The current driller, Redwater Petroleums 1, LSD 16, 36-55-21w4, about 8 miles south of Imperial-Redwater 3, oil well, is drilling below 2,700 ft.

Cooking Lake.—Calmont Oils and Calmont-Leduc Oils 3, LSD 4, 14-51-21w4, wildcat on Imperial Oil lands at Cooking Lake, is now coring below 3,384 ft. The lower Cretaceous was topped about 3,110 ft., and the entire section is being cored. Drill-stem tests will be made when showings warrant, probably around the 3,600-ft. level in the base of lower Cretaceous. Main objective is the underlying Devonian, which yielded the Leduc and Redwater main producing zones to the west and north of the Cooking Lake venture.

Black Diamond.—Anglo-Black Diamond 1, LSD 12, 12-20-2w5, joint venture of Anglo Canadian Oils and Gas & Oil Products, Ltd., about 18 miles south of Calgary and a few miles east of the Turner Valley field, is expected nearing top of its Madison limestone objective. The key test is currently drilling at 8,950 ft., with Madison top expected close to the 9,000-ft. level.

Ellscot.—Stanolind Oil & Gas Co. are commencing to launch a large scale exploratory drilling program on the north central Alberta plains. First test will be in the Ellscot area, 20 miles southeast of Athabaska, with five other wells in a 50-mile spread between Calling Lake and Lac la Biche to the north and east of Athabaska. The tests will probe oil and gas possibilities down to and including the Devonian equivalents of the Leduc-Redwater producing zones.

ILLINOIS

White County Gets New Pool Opener

MATTOON.—C. E. Brehm has what appears to be a new pool opener in the area northwest of Crossville, Ill. The well, 1 Blackford, SE NW NE 34-3s-10e, White County, had a recovery of 340 ft. of oil and 44 ft. of oil-cut mud on a 1 hour drill-stem test of the Cypress at 2,752-2,861 ft. Operator has set casing for further tests of the pay. The bottom-hole pressure on the test was 850 psi.

In the area southwest of Carmi, Ill., Wayne Drilling Co. is preparing to run dril-stem test on the McClosky at 1 Fairgrounds, SW NW NE 23-5s-9e, White County. Total depth is 3,219 ft.

In the area about 2 miles southwest of Crossville, Ill., Jack Stapp has run casing for a test of the Rosiclare in a former dry hole. The well, 1 Rudolph, NE SE NE 28-4s-10e, has casing set at 3,033 ft. on top of the Rosiclare and has a total depth of 3,065 ft.

THE OIL AND GAS JOURNAL

"It's ingenious and it makes dandy butter, but I don't know how it will go over with th' boss!"

FRANK W WHEATLEY
Feature of the Week
WHEN IT COMES TO PIPE LINES COME TO WHEATLEY'S
When It Comes to Pumps, Come to Wheatley
Frank Wheatley Pump & Valve Mfr.
Hale Station, Sand Springs Road, Tulsa, Oklahoma

National Associated Petroleum Co. opened two pools in Christian County in the latter months of last year. Assumption pool was opened in October with production from the Devonian, and in December, the same operator found new production in 9-13n-1e. Last week National Associated completed two more wells in this section; 2 Lawrence, NW NE SE of the section, with initial production of 52 bbl. from the Benoist at 1,040-60 ft., and 5 Lawrence, NW SE SE, completed in the Benoist for 66 bbl. per day.

Development of North Maud pool continued with three completions reported last week. Olen D. Sharp completed 1 Wirth, SW NE NW 21-1s-13w, for 25 bbl. per day from the O'Hara, while two wells were completed in the Benoist by Calvert & Willis for 50 bbl. and 80 bbl. respectively. The Maud area was very active during the last year with two new pools added in August. These were Central Maud and West Maud.

ILLINOIS SUCCESSFUL WILDCAT

Jefferson County: Hubert E. Howard 1 A. R. McLaughlin, NW SE SW 2-3s-2e, IP 12 bbl., Aux Vases, 2570-82 ft., TD 2,796 ft.

ILLINOIS WILDCAT FAILURES

Champaign County: E. A. Howe 1 Richmond, NW SE NW 23-21n-7e, dry, TD 1,120 ft.

Clark County: Schafer & Granholm 1 W. A. Robinson, NW NE SW 17-11n-10w, dry, TD 2,130 ft.

Coles County: L. Deay et al 1 M. Schweighart, NW NE SE 9-13n-8e, dry, TD 452 ft.

Jasper County: G. Lawrence 1 McCoy, NE NW SE 25-8n-10e, dry, TD 2,363 ft.

Madison County: J. R. Bradshaw 1 F. W. Seivers, SW SW NE 9-6n-6w, dry, TD 560 ft.

Richland County: Superior Oil Co. 1 E. Crites, SW NE NW 28-3n-14w, dry, TD 3,262 ft.

Wayne County: W. O. Allen 1 Alderson NW NW NW 36-2n-5e, dry, TD 3,010 ft.

J. W. Rudy 1 Font, SW SW NE 19-2n-9e, dry, TD 3,100 ft.

National Associated Petroleum Co. 1 Henson et al, SW SW SW 18-1n-5e, dry, TD 2,984 ft.

Robinson & Puckett 1 E. Heron, NW NE NW 13-2s-8e, dry, TD 3,502 ft.

White County: F-B Drilling Co. 1 R. Stanley, SW SE NW 34-4s-10e, dry, TD 3,151 ft.

Gilliam Drilling Co. 1 Ford, NE SE SW 18-5s-14w, dry, TD 3,108 ft.

OKLAHOMA

Beckham County Gets Another Oiler

SHELL OIL CO. 1 Kelly, C NE SW 23-10n-21w, Beckham County, flowed 45°-gravity oil at an estimated rate of 960 bbl. per day on a drill-stem test taken at 9,605-83 ft. On datum calculated from an elevation of 1,913 ft. the test was taken at —7,692-7,770 ft. or about 350 ft. lower than the oil pay in the discovery well located 1 mile to the north and about 300 ft. below the lower oil pay in Union Producing Co. 1-A Misic which is 1 mile east of the Kelly well. The following details of the drill-stem test have been released. Tester was open for 3 hours and 25 minutes with gas appearing in 1 hour and 30 minutes. The well started to unload after 1 hour and 35 minutes with oil showing at the surface in 2 hours and 45 minutes. Gas production was at the rate of 865,000 cu. ft. per day. Recovery at the end of the test was 4,320 ft. of oil and 160 ft. of oil-cut mud.

F. B. Murta has gas and oil on drill-stem test of the Hughes County wildcat, 1 Davis, SW SW NW 20-8n-9e, about 2½ miles west of Yeager. A 17-minute drill-stem test of the Cromwell at 3,320-25 ft. had gas estimated at 10,000,000 cu. ft. and recovered light green oil and distillate.

The Grant County Wilcox discovery well,

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Washington 25, D. C. Notice is hereby given that the lands listed herein are offered through sealed bids on the terms hereinafter specified, to qualified bidders of the highest cash amounts per acre as a bonus for the privilege of leasing the lands under sec. 17 of the Leasing Act of February 25, 1920 (41 Stat. 437; 30 U.S.C. sec. 181), as amended. All bids must be submitted to the Director, Bureau of Land Management, Washington 25, D. C., on or before 1 p.m. of the date set out herein. Each bidder must submit with the bid one-fifth of the amount bid in cash or by certified check on a solvent bank or by money order made payable to the order of the Treasurer of the United States, and file the showing of qualifications to receive a lease required under 43 CFR 192.42 (b) and (c). The envelopes should be plainly marked that they are not to be opened before the date and hour set out herein, and should show the number of the parcel and the name of the field. No bids received after the hour fixed herein for receiving bids will be considered. The remainder of the bonus and the annual rental must be paid and an acceptable surety bond in the sum of at least double the amount of rental, but in no case less than $1,000 nor more than $5,000, must be furnished by a successful bidder prior to the issuance of a lease. An acceptable $5,000 surety bond will be required prior to commencing drilling operations on the land. The deposits of the other bidders will be returned upon acceptance of the successful bids. Bidders are warned against violation of section 59, U.S. Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids. Royalties payable to the United States will be at the rate of 12½ per cent to 25 per cent for oil, and 12½ per cent to 16⅔ per cent for gas, in accordance with Schedule B in the lease form. Annual rental will be at the rate of $1.00 per acre. The land is offered in one parcel described as lot 2, sec. 30, T. 17 N., R. 16 W., La. M., Caddo Parish, Louisiana, 34.39 acres and is within the known geologic structure of the Waskom gas field undefined. Bids must be submitted on or before 1 p.m., February 9, 1949. Marion Clawson, Director.

Mid-Continent Petroleum Corp. and Vierson-Cochran 1 Vollmer, C NE NE 1-25n-5w, continues testing with production reported to be about 40 bbl. per hour of 44°-gravity oil on ⅜-in. choke.

Foster Drilling Co. 1 Deacon, NE NE SW 25-17n-5e, Lincoln County wildcat, continues testing the Bartlesville. The well is reported to be swabbing about 4 bbl. per hour. Top of the sand was called at 3,400 ft., and well was drilled to 3,430 ft.

The Pottawatomie County prospective discovery well, Davon Oil Co. and Atlantic Refining Co. 1 Santa Fe Rod and Gun Club, NW NW SE 26-11n-4e, flowed by heads from pay at 4,787-4,818 ft. in basal Pennsylvanian and was shut in for tanks.

OKLAHOMA SUCCESSFUL WILDCATS

Garvin County: California Co. 1 Graham, NE NE SW 36-4n-2w, flowed 113 bbl. of 43°-gravity oil per day through ¼-in. choke from Bromide sand at 7,550-60 ft.; Hoxbar 3,905 ft., Deese sand 6,324-95 ft., Trenton 6,832 ft., McLish lime 7,655 ft., TD 7,698 ft.

Noble County: Falcon Seaboard 1 Palmer, NE NW NW 13-13n-8e, pumped 112 bbl. of 39°-gravity oil per day from Union Valley-Cromwell; Checkerboard 1,173 ft., Oswego 2,210 ft., Prue 2,220 ft., Skinner 2,439 ft., Red Fork 2,694 ft., Inola 2,885 ft., Bartlesville 2,891 ft., Booch 3,197 ft., TD 3,436 ft.

Pottawatomie County: Sadler 1 Gaddy, NW NW SE 21-10n-2e, flowed 270 bbl. of 37.8°-gravity oil per day through ¼-in. choke from Wilcox at 5,986-98 ft.; Hogshooter 4,000 ft., Checkerboard 4,290 ft., Cleveland 4,440 ft., Earlsboro 5,245 ft., Mayes 5,415 ft., Woodford 5,460 ft., Hunton 5,560 ft., Sylvan 5,715 ft., Viola 5,832 ft., TD 6,078 ft.

Seminole County: New pay in Bowlegs field—Sadler 1 Miller, SE SE SW 18-8n-7e, flowed 110 bbl. of oil per day through ¼-in. choke from Hunton lime; Mayes 3,805 ft., Woodford 3,895 ft., Sylvan 4,022 ft., Viola 4,108 ft., dolomite 4,173 ft., Wilcox 4,193 ft., TD 4,212 ft.

Stephens County: Tide Water et al 1 South Marlow Unit, C SE SW 27-2n-7w, flowed 370 bbl. of 59°-gravity distillate from Pennsylvanian sands; TD 11,575 ft.

OKLAHOMA WILDCAT FAILURES

Carter County: Sun Oil Co. 1 Higgins, SW SW NE 36-1s-3w, dry, TD 6,160 ft., Deese 3,572 ft., Springer 4,410 ft., sand 4,690-4,755 ft., 4,836-74 ft., 4,898-4,954 ft., 5,194-5,239 ft., 5,241-79 ft., 5,894-5,914 ft., 5,955-71 ft. and 6,150-60 ft.

Continental 1 Filleah Jim, SW SW SE 12-4s-1w, dry, TD 7,300 ft., Dornick Hills 1,280 ft., Wapanucka-Springer 2,235 ft., Springer 2,894 ft., sand 6,992 ft.

Garvin County: Cooper & Lewis 1 Lewis, SW SW SW 17-3n-3e, dry, TD 2,085 ft., basal Pennsylvanian-Simpson 1,990 ft., Simpson sand 2,040 ft. with show of oil.

Kiowa County: Reynolds and O'Brecht 1 Scott-McDonald, SE SW SE 22-6n-20w, dry, TD 2,065 ft., granite 650 ft.

Oklahoma County: Peppers Refining Co. 1 Macklenburg, NW SW SW 26-13n-2w, dry, TD 6,647 ft., Oswego 5,798 ft., basal Pennsylvanian-Hunton 6,110 ft., Sylvan 6,277 ft., Viola 6,384 ft., dense 6,429 ft., Wilcox 6,527 ft., second Wilcox 6,639 ft.

Payne County: Eason & Co. 1 Ohio School Land, NE NE SW 16-18n-1e, dry, TD 5,200 ft., Pawhuska 1,850 ft., Avant 3,025 ft., upper Layton 3,545 ft., Hogshooter 3,680 ft., Layton 3,727 ft., Checkerboard 4,000 ft., Oswego 4,243 ft., Verdigris 4,467 ft., Skinner 4,474 ft., Red Fork 4,562 ft., Bartlesville 4,670 ft., Mississippian 4,734 ft., Woodford 4,878 ft., Hunton 4,945 ft., Sylvan 4,964 ft., Viola 5,043 ft., dolomite 5,094 ft., Wilcox 5,122 ft., second Wilcox 5,180 ft.

Howell & Howell 1 Human, NE NW SE 5-20n-3e, dry, TD 4,300 ft., upper Layton 2,930 ft., Hogshooter 3,103 ft., lower Layton 3,212 ft., Checkerboard 3,495 ft., Cleveland 3,560 ft., Oswego 3,665 ft., Mississippian 4,280 ft.

Stephens County: Carl Carter et al 1 Sledge, SE NW 17-1s-5w, dry, TD 1,830 ft., no tops reported, no shows.

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Budget Gives More for Federal Oil Agencies

(Continued from page 51)

work would be increased from $9,750,000 to $10,000,000, of which $298,390 is earmarked for secondary recovery as against $292,530 this year. The appropriation for oil and gas investigations would be increased from $606,000 to $690,000, of which $145,200 would be for secondary recovery, and $97,500 is provided for helium utilization and research, against $91,000.

The Navy would be given $10,000,000 for operation and conservation of the naval petroleum reserves, against $9,245,500 for this year. No further provision is made for the drilling of core holes by the Bureau of Mines in naval oil shale reserve No. 1, Colorado, for which $144,000 was available this year, but a new item of $1,000,000 is included for operation of petroleum reserve No. 1 and $25,000 for exploration in petroleum reserve No. 3, together with $8,851,000 for exploration and development in No. 1, for which $8,995,400 was provided this year. No further provision is made for exploration in Naval Reserve No. 4 in Alaska, for which $14,600,000

was appropriated this year to remain available until June 30, 1951.

The budget estimates provide $3,861,000 for the activities of the Federal Power Commission, other than flood-control surveys, against $3,649,550 this year, with $383,451 for certificates of public convenience and necessity, against $365,258 this year.

The President proposed that the appropriation for antitrust enforcement by the Department of Justice be increased from $3,411,700 to $3,650,000, and that the fund for the Federal Trade Commission be upped from $3,448,035 to $3,739,000.

Estimates for the Maritime Commission total $101,600,000, plus $60,000,000 in new contract authorization, and in addition, supplemental estimates for ship construction are included in the budget in the amount of $2,000,000 in cash and $31,500,000 in contract authorization for the fiscal year 1949, plus $13,000,000 to liquidate this authorization in 1950. The estimates reflect increasing emphasis upon new ship construction offsetting a decline in vessel sales, chartering, and operating functions.

The appropriation for the National Security Resources Board is to be increased from $3,000,000 to $4,000,000 for intensification of the development of resources and requirement data as a basis of planning mobilization in the event of war.

Drillers' Insurance Costs Rise in Texas

(Continued from page 40)

bility underwritten by Lloyds or other large insurance underwriters. It also is thought that the insurance companies will insist that underground damage coverage be issued on a blanket basis, and that such coverage would be written only in conjunction with general liability and blowout and explosion insurance.

Cause for Higher Rates

The higher over-all insurance rates and the exclusion of liability for subsurface property damage from general liability insurance are the result of a Texas Supreme Court ruling last March in the case of Elliff vs. Texon Drilling Co. In this case the court upheld a lower court decision that Texon was liable for waste of gas and distillate drained from the reservoir under property on which Elliff owned the surface and half or all of the royalty. The claim resulted when a well (No. 2 Driscoll-Sevier) being drilled by Texon as an offset to No. 1 Elliff, in Agua Dulce field, blew out and cratered. Attempts to control it were unsuccessful and a fissure around the wild well increased until it enveloped and destroyed No. 1 Elliff.

A trial court held that Texon was negligent in failing to use drilling mud of sufficient weight, and awarded Elliff damages totaling $154,518. This amount included $5,970 for damages to cattle and land and $148,548 for Elliff's share of the gas and distillate drained from underneath the plaintiff's property "without regard to whether they were wasted and dissipated from above the Driscoll land or from petitioner's land." The Texas Supreme Court upheld the principle of liability for underground damages but sent the case back to the lower court for reconsideration as to the correctness of the measure of damages.

Because of this decision, insurance companies last November asked the board that they be allowed to set separate and higher rates to cover underground property damage, claiming that the original rates on property damage never included any premium charge for subsurface damage liability. They first asked that a rate of 5 cents per $100 annual payroll for each $1,000 coverage on subsurface damage be established. Opposed by the drilling industry on the grounds that such rates were excessive and without adequate basis, the insurance companies in December withdrew this proposed rate and asked only that underground damage coverage be A-rated.

One of the greatest difficulties in obtaining coverage against subsurface damage, insofar as drilling contractors' liability insurance is concerned, is the broad form of the "hold-harmless" clause in general use in drilling contracts. This clause, present in some form or other in almost all contracts, causes the drilling contractor to assume all liability for injuries to persons or property arising out of the drilling operation. The contractor, in other words, insures or underwrites the operator's liability even though the damages may result from negligence by the operator himself and the contractor is without fault.

In the past, major oil companies have not adhered to the literal legal requirements of the clause, but instead have applied a fair and reasonable construction of the rights of both parties. At Agua Dulce, Texon Drilling Co. was both the drilling contractor and operator. Under the principles of law as laid down in the Elliff v. Texon case, however, the potential liabilities under the hold-harmless clause are so great that they cannot be disregarded.

High Premium Necessary

In board hearings at Austin the insurance companies pointed out that while it might be possible to reduce the rate for primary underground coverage, so long as the drilling contracts contained broad commitments whereby the contractor agreed to hold the operator harmless from all damages regardless of whether the operator was negligent or not, the insurance companies in offering contractual liability coverage for underground risk (as well as aboveground risks) would be forced to charge a high premium because of the extensive potential liability involved. They urged that the drilling contract be clarified to express what the operator actually expected of the contractor and that the contractor's liability under the hold-harmless clause be held within reasonable limits. If this were done insurance companies would know the extent to which they might be held liable under contractual liability coverage, and thereby would be able to assess a proper and reasonable premium.

Some progress is being made toward obtaining a modification of the hold-harmless clause in conferences of major oil company and drilling contractor representatives. The problem is far from being solved, but it is believed that a satisfactory understanding will be reached. Associations which have appointed committees to consider this problem are: American Association of Drilling Contractors, American Petroleum Institute, and the Texas Mid-Continent Oil and Gas Association.

In this connection, some operators have indicated they are willing to modify the hold-harmless clause in some respects. These are: (1) that the contractor would not be held liable for damages resulting from the sole negligence of the operator; (2) the contractor would hold the operator harmless against damage occasioned by the contractor's negligence or where it is not due to the sole negligence of the operator, and (3) that the contractor should insure his liability under hold-harmless clause and the cost of such insurance would be a legitimate charge in the contractor's drilling price. Until such an agreement is reached the drilling contractor will be faced with large potential damages losses which cannot be wholly insured against.

The text of the endorsement applicable to new and renewal insurance after January 1, 1949, is as follows:

"It is agreed that such insurance as is afforded by this policy does not apply, with respect to property damage liability, to damages because of:

"1. Injury to, destruction of, or loss or impairment of any property right in or to oil, gas, or other mineral substance or water if at the time of the act or omission causing such injury, destruction, loss or impairment, said substance has not been reduced to physical possession above the surface of the earth.

"2. The increased cost of reducing any of such substances to physical possession above the surface of the earth, or the expense incurred or rendered necessary to prevent or minimize loss of or damage to property resulting from acts or omissions causing underground damage.

"3. Loss of or damage to any well, hole, formation, strata, or area beneath the surface of the earth."

STATISTICS and

WEEKLY WELL COMPLETIONS . . . WEEK ENDED JANUARY 8, 1949

	Total of all wells					Cum.		Wildcat completions and discoveries					Cumulative total, 1949				
	Comp.	Oil	Gas	Dry	Footage	1949	1948	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	19	10	0	*9	19,038	19	74	0	0	0	0	0	0	0	0	0	0
Pennsylvania	40	18	3	†19	69,606	40	130	0	0	0	0	0	0	0	0	0	0
West Virginia	7	1	5	1	22,047	7	22	0	0	0	0	0	0	0	0	0	0
Ohio	15	4	6	5	38,741	15	43	0	0	0	0	0	0	0	0	0	0
Indiana	26	10	0	16	48,551	26	26	0	0	0	4	4	0	0	0	4	4
Kentucky	9	5	0	4	12,912	9	25	0	0	0	1	1	0	0	0	1	1
Illinois	53	23	0	30	147,176	53	92	1	0	0	12	13	1	0	0	12	13
Michigan	23	12	1	10	56,571	23	45	1	0	0	7	8	1	0	0	7	8
Kansas	57	26	1	‡30	180,642	57	98	1	0	0	9	10	1	0	0	9	10
Neb., Mo., Iowa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oklahoma	74	51	2	§21	355,104	74	104	4	1	0	8	13	4	1	0	8	13
Texas	268	161	14	93	1,114,338	268	368	15	0	1	46	62	15	0	1	46	62
North Central (Dist. 7-B & 9)	97	47	0	¶50	302,910	97	117	10	0	0	21	31	10	0	0	21	31
West (Dist. 7-C & 8)	46	43	0	3	219,941	46	92	1	0	0	2	3	1	0	0	2	3
Panhandle (Dist. 10)	23	10	9	4	72,840	23	25	0	0	0	0	0	0	0	0	0	0
Eastern (Dist. 5 & 6)	7	7	0	0	27,251	7	24	0	0	0	0	0	0	0	0	0	0
Gulf Coast (Dist. 2 & 3)	50	24	5	21	297,338	50	58	2	0	1	13	16	2	0	1	13	16
Southwest (Dist. 1 & 4)	45	30	0	15	194,058	45	52	2	0	0	10	12	2	0	0	10	12
Louisiana	70	53	5	12	290,514	70	82	0	0	0	3	3	0	0	0	3	3
Northern	54	39	5	10	151,600	54	65	0	0	0	3	3	0	0	0	3	3
Southern	16	14	0	2	138,914	16	17	0	0	0	0	0	0	0	0	0	0
Arkansas	0	0	0	0	0	0	21	0	0	0	0	0	0	0	0	0	0
Mississippi	10	5	1	4	79,317	10	15	0	0	1	1	2	0	0	1	1	2
Southeastern States	2	1	0	1	23,465	2	1	0	0	0	1	1	0	0	0	1	1
Montana	3	3	0	0	9,546	3	11	0	0	0	0	0	0	0	0	0	0
Wyoming	9	7	0	2	45,190	9	14	0	0	0	1	1	0	0	0	1	1
Colorado-Utah	5	0	0	5	13,524	5	16	0	0	0	2	2	0	0	0	2	2
New Mexico	9	5	0	4	65,421	9	30	0	0	0	0	0	0	0	0	0	0
California	46	39	0	7	189,887	46	78	2	0	0	6	8	2	0	0	6	8
Total United States	745	434	38	273	3,072,104	745	1,295	24	1	2	101	128	24	1	2	101	128
Total previous week	774	433	53	288	2,790,649	39,145	33,807	5	3	7	108	123	863	83	246	5,153	6,345
Total January 10, 1948	671	382	45	244	2,263,182			18	0	3	94	115	24	0	7	160	191

Service wells included: *9, †18, ‡3, §1, ¶2.

CRUDE PRICES AND REFINERY ACTIVITY

GRAVITY SCHEDULES

Gravity—	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$2.17	....	....	....
19-19.9	2.19	....	....	....
20-20.9	2.21	$2.25	....	$2.12
21-21.9	2.23	2.27	....	2.14
22-22.9	2.27	2.29	....	2.16
23-23.9	2.30	2.31	....	2.18
24-24.9	2.34	2.33	$2.56	2.20
25-25.9	2.38	2.36	2.58	2.22
26-26.9	2.41	2.37	2.60	2.24
27-27.9	2.45	2.39	2.62	2.26
28-28.9	2.49	2.41	2.64	2.28
29-29.9	2.52	2.43	2.66	2.30
30-30.9	2.56	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.62	2.49	2.72	2.36
33-33.9	....	2.51	2.74	2.38
34-34.9	....	2.53	2.76	2.40
35-35.9	....	2.55	2.78	2.42
36-36.9	....	2.57	2.80	2.44
37-37.9	....	2.59	2.82	2.46
38-38.9	....	2.61	2.84	2.48
39-39.9	....	2.63	2.86	2.50
40 and above	....	2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point. †Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947. (For detailed price changes in all fields see The Oil and Gas Journal, January 1, 1948, page 107.)

A.P.I. REFINERY REPORT, WEEK ENDED JANUARY 1

(Thousands of barrels)

District—	Crude runs, daily avg.	Production: Gasoline†	Kerosine	Gas & dist. oil	Residual	Stocks at refineries, bulk terminals, in transit and in pipe lines: Gasoline*	Kerosine	Gas & dist. oil	Residual
East Coast	819	2,188	304	1,708	1,484	23,488	10,702	23,868	12,615
Appalachian:									
District 1	108	322	55	118	102	2,501	396	948	439
District 2	70	258	24	57	99	1,233	115	262	229
Ind., Ill., Ky.	938	3,315	440	997	1,064	21,881	4,247	11,111	5,516
Okla., Kans., Mo.	441	1,705	147	532	549	10,087	1,386	5,447	2,819
Inland Texas	278	1,190	109	193	454	3,943	641	881	1,235
Texas Gulf Coast	1,540	4,700	858	2,404	1,902	17,053	2,085	13,952	10,906
La. Gulf Coast	449	1,431	405	701	522	6,055	2,246	3,909	3,755
N. La. & Ark.	81	229	54	84	126	2,632	502	993	316
Rocky Mountain									
New Mexico	15	53	7	19	27	95	25	57	36
Other Rocky Mtn.	156	459	34	178	233	2,473	225	1,573	1,094
California	993	2,973	89	1,209	2,687	12,622	823	14,150	47,334
Jan. 1, 1949	5,888	18,859	2,526	8,200	9,249	104,063	24,373	77,151	86,294
Dec. 25, 1948	5,784	18,175	2,542	7,776	9,121	100,286	24,306	79,271	86,181
Jan. 3, 1948	5,637	17,163	2,346	7,405	9,392	94,099	15,983	49,934	51,436

*Finished and unfinished. †At refineries including natural blended.

Bureau of Mines crude-oil stocks 243,017,000 bbl. as of January 1—up 2,369,000 bbl. One year ago 220,225,000 bbl.

FLAT CRUDE PRICES

Representative posted schedules per bbl.	
East Texas‡	$2.65
Kettleman Hills, California*	2.14
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.25
Bradford, Pennsylvania	4.10
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.85

*37°-37.9°. †35° and above.

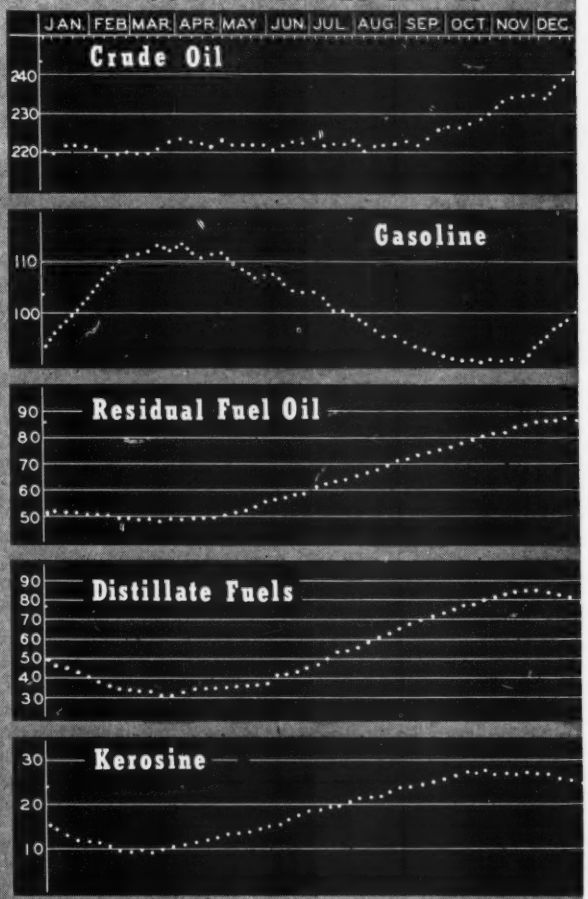
TRENDS

DAILY AVERAGE PRODUCTION FOR WEEK

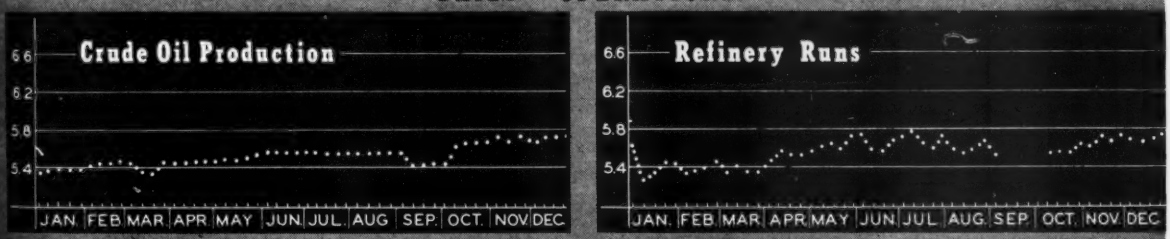
	Jan. 8 crude oil	B. of M. Dec. demand	Jan. 1 crude oil
Alabama	1,300	1,700	1,150
Arkansas	83,950	88,000	82,600
California	950,200	960,000	957,100
Colorado	*62,585	50,000	63,305
Eastern	62,850	65,500	61,250
Florida	1,300	1,100	1,325
Illinois	179,700	168,000	175,100
Indiana	25,700	20,000	24,000
Kansas	301,450	304,000	297,500
Kentucky	24,600	23,000	23,200
Louisiana	503,650	496,000	496,825
North Louisiana	118,600	.....	116,950
South Louisiana	385,050	.....	379,875
Michigan	44,400	45,000	47,700
Mississippi	130,000	131,000	124,900
Montana	25,110	26,000	25,800
Nebraska	300	700	300
New Mexico	134,790	132,000	134,440
Oklahoma	450,150	432,000	444,000
Texas	2,333,490	2,450,000	2,489,650
Dist. 1 (Southwest)	26,910	.....	27,800
Dist. 2 (Southwest)	162,025	.....	176,700
Dist. 4 (Southwest)	225,550	.....	246,675
Dist. 3 (Gulf Coast)	452,755	.....	495,900
Dist. 5 (Eastern)	46,150	.....	50,925
Dist. 6 (Eastern)	115,475	.....	123,525
East Texas field	289,000	.....	289,000
Dist. 7-C (West)	48,350	.....	50,125
Dist. 8 (West)	676,850	.....	733,750
Dist. 7-B (W. Central)	62,600	.....	62,375
Dist. 9 (N. Central)	138,625	.....	143,750
Dist. 10 (Panhandle)	89,200	.....	89,125
Wyoming	153,160	146,000	158,130
Total United States	†5,468,685	5,540,000	5,608,275
Change from prev. wk., dn.	139,590		
Total production January 1-January 8			‡44,545,120 bbl.
Same period last year (crude plus cond.)			43,067,545 bbl.

*Incl. 160 bbl. Utah production. †Not incl. 81,875 bbl. condensate. ‡Incl. 656,050 bbl. condensate.

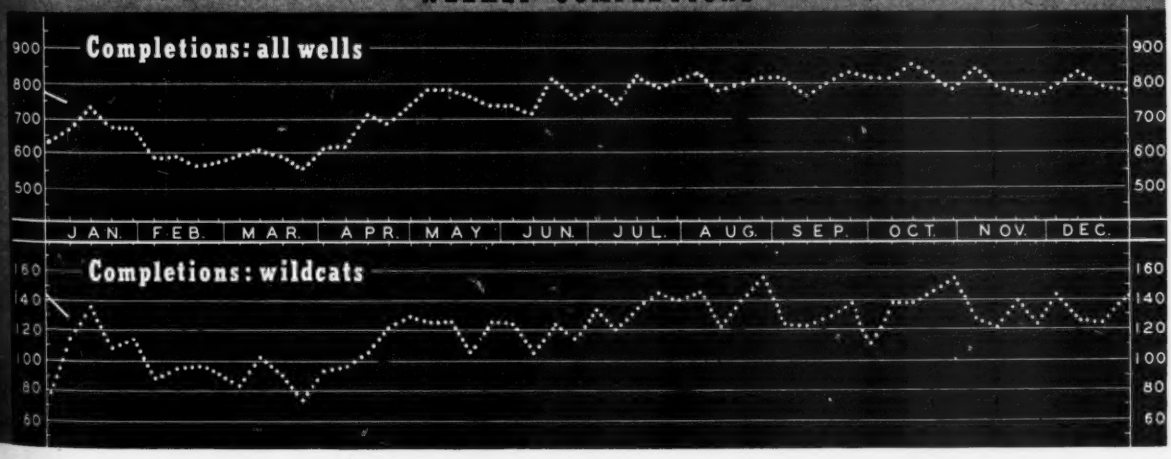
STOCKS IN UNITED STATES



DAILY OPERATIONS



WEEKLY COMPLETIONS



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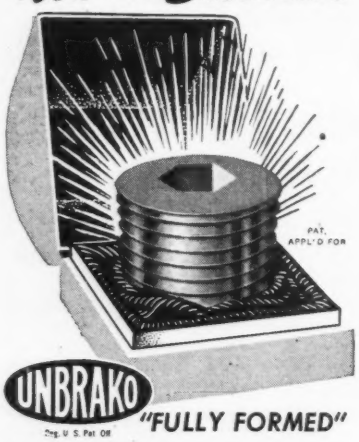

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These entirely new and exclusive precision-made plugs—for water, steam, air, oil and hydraulic pressure—are fully formed with the roundness and concentricity so desirable in a plug. Tests have proven that they materially reduce leakage on some applications and eliminate it entirely on others.

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MARKETS

A WEAKENED fuel-oil market continued last week due principally to the unseasonal weather experienced in widespread areas. Distributor and consumer as well as refiner storage remained at high levels. Best hope for moving material was seen in the coming of normal winter temperatures. The extremely sluggish market for residual oils continued and few observers were optimistic concerning the possibility of market activity picking up to any extent.

A dropping off in the demand this year for oil burners for central heating, steam generation plants, and industrial process equipment is noted in comparing the 59,351 units shipped in October with the 124,409 units shipped in the same month a year ago.

Mid-Continent Area

The few scattered Mid-Continent areas undergoing freezing temperatures in recent weeks have brought no appreciable increase in market activity, while general unseasonal weather continued in most areas. Weakening in price levels for most petroleum products was still noted last week as evidenced by the lowering of published prices for some materials. The recent consistent decline in products price levels has "gone just about as far as it will go" was the opinion of several marketing men last week. It was generally agreed, however, that normal winter temperatures was needed soon to put some life in the present sluggish market trend.

The firm spot in the petroleum products market centered around kerosine and range oil as these materials were reported as "not being freely offered around." No. 2 for the most part was moving slow. One refiner said that he had moved some straw-colored No. 2 at 8½ cents per gallon for spot sales while he was moving dark material at 8¼ cents. No large quanity sales were reported, and many sellers were looking for colder temperatures as the only solution to create a more active market. Mild winter temperatures were causing contract sales to "fall off," life in the present sluggish market.

Stock levels of gasoline continued to gain while sales and inquiries for this product continued slack in the Mid-Continent area. During the past week the posted high for gasoline prices was lowered ⅛ cent per gallon bringing the regular, 73-75 octane, to a range of 10¼-10½ cents. A drop of ⅛ cent on the high of 42-44 kerosine and of ⅛ cent on the high for range oil was also noted last week.

New York Harbor

Only light trading in heating oils was reported in the New York Harbor last week as a result of continued warm weather. Buyers were holding their offers down to 8.5 and 8.7 cents for No. 2 and 10 cents for kerosine. Heavy No. 6 was unimproved with this material said to be available at between $2.35 and $2.40 on the open market.

Threat of a tugboat tieup in the harbor and the possibility of a sudden change in the weather prevented some prices from moving lower. A Weather Bureau report showed that New York City was nearly 20 per cent warmer than normal during the month of December.

Esso Standard Oil Co. announced effective January 6 it was lowering its cargo diesel prices at the Gulf to 8⅛ cents for material with minimum cetane rating of 45 and to 8¼ cents for material with a minimum cetane rating of 50.

Representative Quotations

Representative spot-market quotations of leading suppliers as of January 10, 1949. Figures are f.o.b. plant for tank-car shipment in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor	Texas Gulf Coast
Regular gasoline, 73-75 octane	10-10¼	12.0-12.4* 11.0-12†	10.3-12.5
Premium gasoline, 78-80 octane	10¾-11	12.0-13.4	11.0-13.5
42-44 w.w. kerosine	9¼-9½	10.3-	9.1-10.5
No. 2 straw fuel oil	8¼-8¾	9.1-	9-9½
No. 6 residual	$1.50-1.60	$2.55-2.65	$2.05-2.08

*Branded (74-76 octane); †Unbranded (74-76 octane).

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	8½	8	8¼
Grade 18-55	10.2	9.6	9.9

LUBRICATING OILS

South Texas

200 vis., No. 2-3 neutral	12-13.5
750 vis., No. 3-4 neutral	15-16.5
2,000 No. 5-6 neutral	17-18.5

LUBRICATING OILS

Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	27
200 vis. No. 3 neutral, 0-10 pp.	17

Western Pennsylvania

144-155 vis. 10 p.t. bright stock	30.5-40.5
180 vis. p.t. neutral	29.5-38.5

CRUDE-SCALE WAX

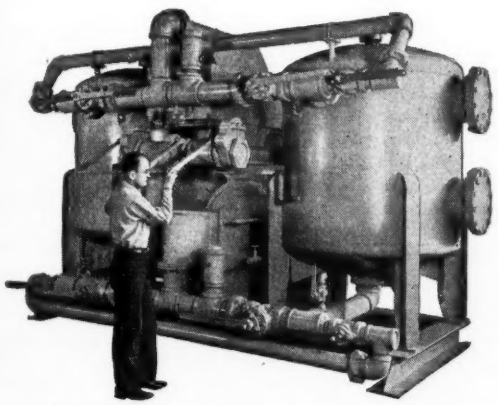
Mid-Continent

122-124 A.M.P.	8½

2 Years' Savings Paid for this Kemp Dryer

The savings were chemicals previously lost in a single process in this plant!

The Kemp Dryer installation dissipated the vapor-cloud and enabled the operator to see the bottom of a synthetic fibre solution tank, and draw off the full safe amount of the viscous material.



The capacity of this Kemp Dynamic Dryer is 1425 scfm. Air enters at 85° F., saturated, and is continuously dried to a dew-point of 0° F.

Previously, the tank could be but partly drained, and the remainder then drawn off as waste.

Then too, all air-operated instruments worked better than ever before and there have been reductions in maintenance and labor.

Operation is virtually automatic, requiring brief attention only when the twin towers are alternately reversed from adsorbing to reactivating cycles.

Kemp Dryers are available in a wide variety of sizes and types from portables to giants.

If it must be DRY . . . remember KEMP. But first, perhaps you'd like to talk with a qualified Kemp engineer — there's one not far from you — or see the Kemp Catalog 25-D.

The C. M. KEMP MANUFACTURINC CO.
405 East Oliver Street, Baltimore 2, Maryland

☐ Please send me your NEW Catalog 25-D on Kemp Dryers.

☐ Please send a Kemp engineer in to see me.

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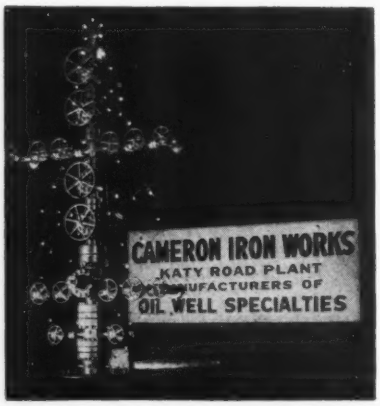
KEMP of BALTIMORE

EQUIPMENT MEN ... in the News

Cameron Christmas Tree Provokes Holiday Interest

A huge christmas tree was assembled and displayed at the Cameron Iron Works, Inc., plant on Katy Road



in Houston during the Christmas holidays. Decorated with colored lights and floodlighted, the big tree attracted the attention of travelers on the busy Old Spanish Trail which flanks the south boundary of the Cameron plant.

The christmas tree is the largest ever assembled, weighing approximately 18,000 lb. and standing over 20 ft. high. It is a 10,000 working-pressure assembly.

Technical Oil Tool Corp. Adds Lunsford to Staff

W. M. (Bill) Lunsford has joined the field engineering staff of Technical Oil Tool Corp., Ltd. He will serve the Louisiana Gulf Coast area working out of Houma, La., as headquarters. Lunsford comes to his new position with a background of 10 years of oil-field experience, principally in the West Texas and Houston areas.

Sargent Elected to Diamond Alkali Post

John A. Sargent has been elected executive vice president of Diamond Alkali Co., advancing to this position from the post of vice president of finance, which he has held since 1947. He joined the company as its treasurer in 1946.

Sargent at one time was vice president and general sales manager of Campbell Metal Window Corp., formerly a subsidiary of American Radiator & Standard Sanitary Corp. When Campbell merged in 1939 with Truscon Steel Co., subsidiary of Republic Steel Corp., he became a sales manager of the Truscon organization.

Ryerson Announces Executive Changes

Joseph T. Ryerson & Son., Inc., Chicago, has elected William Seymour, Jr., vice president; C. L. Hardy, assistant vice president, and Thomas G. Miller, secretary.

Seymour has been with the Ryerson organization 31 years. He will be in charge of plant operations and service for the entire group of 13 Ryerson steel-service plants.

Hardy joined Ryerson in 1927 at its Boston plant. He will serve as an executive in the procurement department. Miller joined Ryerson in 1938, and was made assistant secretary of the company in 1946.

Atwater Joins Thomas Bryan

A. C. Atwater has joined Thomas Bryan & Associates, industrial engineers and constructors, Houston, as manager of the petroleum and chemical division.

He is well known throughout the world for many construction assignments. In 1929 Arthur G. McKee & Co., Cleveland, sent Atwater to Japan as resident project engineer on refineries which Japanese interests had under way. He has also represented McKee in Europe, with headquarters in London. This assignment covered all phases of engineering and construction on petroleum-refining plants in France, Italy, Germany and Romania.

He was project manager on the Great Southern aviation-gasoline plant, Corpus Christi; Premier aviation-gasoline plant at Cotton Valley, La.; and the "quickie" butadiene plant for Humble Oil & Refining Co. at Ingleside, Tex.

He has only recently returned from an assignment by McKee as project and purchasing manager for the construction of the complete refinery of the California Texas Oil Co., Ltd., at Rotterdam, Holland.

Well Equipment Appoints Word

TRACY WORD

Well Equipment Manufacturing Corp. has appointed Tracy T. Word, Jr., as sales manager, placing him in charge of both sales and service activities. In addition to its own manufactured items the company distributes Chiksan swivel joints, Okadee valves, and Anchor burners. Word will also supervise the company training program, under which new men are trained and prepared for field service.

Word replaces G. R. Winder, who has been appointed vice president and sales manager of Chiksan Co., parent organization of Well Equipment Manufacturing Corp.

Process Industries Firm Formed at Pittsburgh

Process Industries Engineers, Inc., has recently been formed at Pittsburgh to integrate two complementary services: the sales of equipment of various nationally known manufacturers, and the design and fabrication of equipment where special designs are necessary.

William W. Calihan, vice president, who recently resigned as director of sales and advertising of H. K. Porter Co., Inc., Pittsburgh, has been continuously affiliated with the processing industries for approximately 20 years.

R. R. Maccary, R. E. Nelson, and R. F. Fey, the company's other officials, have served the processing industries through long-standing associations with prominent manufacturers of process equipment and chemical-plant designers, in executive, engineering, and sales capacities.

Refractories Firm Expands

Walsh Refractories Corp., St. Louis, manufacturer of fire brick, refractories, and high-temperature specialties, has purchased property adjacent to present office and plants as a site for a modern, air-conditioned office building and additional warehousing facilities. The building will be ready for occupancy in about 90 days.

American Steel & Wire Creates New Division

Establishment of a separate stainless-steel sales division, as part of the company's intensified effort in the field of stainless-steel wire, bars, and strip, has been announced by American Steel & Wire Co., United States Steel subsidiary.

Banks E. Eudy, a pioneer in this field, was named as manager of the new division, to be known as the Stainless Steel Products Sales Division. Appointed as assistant manager was C. Richard Horwedel, another authority on stainless and other high-alloy metals. Together the two have a combined record of 44 years of service in stainless steel manufacture and merchandising.

United Supply Appoints Reagor

BEN REAGOR

Ben Reagor, formerly with Superior Iron Works, and later with Grigsby Tool Co., Shreveport, has been named representative for United Supply & Manufacturing Co., Tulsa, and will be in charge of the company's new offices, recently opened in Shreveport.

This is the first time that United Supply has had representation in Northern Louisiana, according to Brooks Gutelius, Jr. Reagor has for many years been engaged in the supply business in Louisiana, Texas, and Mississippi. United has 17 stores in the Mid-Continent area.

Power Equipment Companies Merge

Merger of two power equipment manufacturers, Combustion Engineering Co., Inc., and Superheater Co., has been consummated by approval of the stockholders of both companies. The new name is Combustion Engineering - Superheater, Inc. The original Combustion organization was founded in 1914. Superheater Co. was organized in 1910 as the Locomotive Superheater Co.

Kohler Celebrates 75th Anniversary

More than 550 members of Kohler Co.'s "quarter century" club attended the twenty-fifth annual Christmas Eve dinner of the group which was also the seventy-fifth anniversary of the company's founding.

New members inducted into the club numbered 117, bringing to 553 the number of employes who have been connected with the organization for 25 years or more. The company employs about 4,000 in its offices and factories.

A voluntary retirement - income plan to which members of the Kohler Co. organization with 5 years of continuous service are eligible has been put into effect by Herbert V. Kohler, president.

Chiksan Names Winder Sales Vice President

G. R. WINDER

Chiksan Co., Brea, Calif., has appointed G. R. Winder as vice president and sales manager. He will also be vice president and sales manager of Chiksan Export Co.

Winder has been transferred from Well Equipment Manufacturing Corp., Houston, a Chiksan subsidiary, where he has served in the same capacity for the past 3 years. The new assignment brings him back to Chiksan headquarters where he was a former member of the sales department. He replaces L. J. Laird, who resigned.

Forty-Two Attend Barnes Sales Meet

Forty - two factory representatives from the United States and Canada of Barnes Manufacturing Co. recently attended a 5-day sales meeting held at company headquarters in Mansfield, Ohio, presided over by E. B. Hout, vice president in charge of sales. The representatives saw at the sessions the new product improvements and additions to the Barnes line, including self - priming centrifugal pump and new deep-well pumping head. Plans for intensifying the distribution of all Barnes products during 1949 were made at the meeting.

Bridgeport Concern Makes Appointments

Manning, Maxwell & Moore, Inc., Bridgeport, announces the appointments of Clifford E. Mathewson, John R. Parsons, and A. C. Stauch as industrial-instrument specialists. Mathewson will be located in the Pittsburgh district office, Parsons is attached to the New York district office, and A. C. Stauch is in the Chicago office. The American Industrial Instrument division of the company dates back 99 years when the first instruments were made.

American Flexible Names Sales-Engineering Firm

Ehret & Kinsey, Chicago, has been appointed as sales engineers by Everett F. Zurn, president, American Flexible Coupling Co., Erie, Pa. The three-part American Flexible coupling, manufactured for over 20 years, and the line of gear type couplings will be handled by the sales firm.

Clapp Advanced by American Brake Shoe

Philip H. Clapp, Jr., formerly sales representative, has been appointed sales manager of the Engineered Castings division of American Brake Shoe Co. Clapp has been with Brake Shoe since 1946. He will continue to be located at the division's headquarters in Rochester, N. Y.

Steel Subsidiaries Make Executive Appointments

Executive sales changes have been announced by two United States Steel subsidiaries, United States Steel Supply Co. and Carnegie-Illinois Steel Corp. George O. With has been appointed assistant vice president of the supply company. He has been manager of sales, construction industries, of Carnegie-Illinois since 1937. Dwight

Representatives of Barnes Manufacturing Co. from the United States and Canada attend sales meeting at Mansfield

L. Merrell has been appointed to succeed With at Carnegie-Illinois. He has been With's assistant since 1947.

American Steel & Wire Co. Increases Duluth Capacity

Steel capacity at American Steel & Wire Co.'s Duluth Works will be increased 243,000 tons a year, or 35 per cent, as a part of a replacement, improvement, and rebuilding program announced by B. E. Pheneger, district manager of operations for this United States Steel Corp., subsidiary. The Duluth Works, only steel-producing plant in the Northwest, turns out steel, semifinished steel products, wire, and manufacturers and merchant wire products. It has 3,500 employes.

Oil Well Engineering Co. Appoints D. F. O'Connell

Oil Well Engineering Co., Ltd., has appointed D. F. O'Connell as American representative in charge of its New York office. O'Connell, who has been connected with Oil Well Engineering Co. for a period of 20 years, succeeds A. R. Meyer, who has resigned.

Process Engineers Appoint Chicago, St. Louis Firms

Industrial Process Engineers, West New York, N. J., has appointed A. J. Foley Co. as Chicago territory representatives. Midwest Equipment & Supply Co. has been appointed representative for the St. Louis territory.

Geolograph Opens District Office

Geolograph Co., Inc., has opened a district office in Casper, Wyo., to serve Wyoming, Montana, Colorado, Utah, and North Dakota. Harry F. Miller has been transferred from the Oklahoma City general office to Casper. Other district offices are located at Shreveport, La., and Odessa and Alice, Tex.

Opens Cleveland Office

Kinney Manufacturing Co., Boston, manufacturer of liquid pumps, vacuum pumps, clutches, and bituminous distributors, has opened a branch office at Cleveland. William B. Mills, formerly of the Boston office and more recently located in Chicago, will be manager.

Kimble Appoints Dennis

E. B. Dennis, Jr., has been named general sales manager of Kimble Glass, division of Owens-Illinois Glass Co. Dennis joined Kimble Glass as a salesman in the New York branch office in 1933.

Davisson Joins Young Radiator

Gordon Davisson has recently joined the staff of Young Radiator Co., Racine, Wis., as an engineering representative. Upon the completion of an on-the-job training course to familiarize himself with all phases of the manufacture and engineering of Young products, he will devote his time primarily to field and service work. He has been chief sales engineer for Linear, Inc., and has also seen service with International Harvester Co.

Metallizing Contractors Hold Annual Meeting

At the annual meeting of the American Metallizing Contractors Association held at Tulsa Peter G. Dennison was elected president, K. B. Smith vice president, and Walter B. Meyer secretary-treasurer. Dennison is president and founder of Metal Spraying Corp., Milwaukee. Smith is vice president and general manager of Dix Engineering Co., Lincoln Park, Mich. Meyer is manager of the metallizing division of the John Nooter Boiler Works Co., St. Louis.

Wiley Completes McCullough Tour

J. L. Wiley, director of research, eastern division, McCullough Tool Co., has completed a tour of the 26 McCullough service locations. He is now at the Los Angeles headquarters where he and Philip W. Martin, western division research director, are laying plans to standardize and consolidate research activities of the eastern and western divisions.

Cutler-Hammer Relocates Office

Cutler-Hammer, Inc., pioneer electrical manufacturer, Milwaukee, has moved its Indianapolis sales office to new quarters. The new offices provide expanded facilities for sales activities in that area. F. W. Gilchrist manages the office as a branch of the company's Chicago district office.

Settle Joins Schaub

Fred H. Schaub Engineering Co., Inc., Chicago, has appointed Frank T. Settle as field sales engineer. Settle has been with the General Tire & Rubber Co., Akron, for the past 10 years, as kraft engineer and later as sales manager in the Rocky Mountain division.

Two Promoted by Link-Belt

R. E. Whinrey, formerly superintendent, Link-Belt Co., has been appointed to the newly created position of assistant general manager of the Link-Belt Dodge plant in Indianapolis. L. C. Heinlein, formerly assistant superintendent, has been appointed superintendent of this plant. The Dodge plant is devoted to the manufacturer of Link-Belt ball and roller bearings of both mounted and unmounted types.

Engineering Controls Appoints Tacchella

A. Tacchella has been appointed project engineer of Engineering Controls, Inc., Los Angeles and New York designers and manufacturers of vapor-phase engine-cooling and waste-heat-recovery systems. Tacchella had been in charge of West Coast operations of Busch Sulzer Co. He will maintain headquarters at the Los Angeles office.

Mill Appointed Division Controller National Supply

Fred W. Mill has been appointed division controller of National Supply Co., Torrance, Calif. Mill has been with the company since 1917. In 1945 he was transferred to the executive offices in Pittsburgh as general supervisor of plant accounting, and in 1947 became general plant controller. He takes over the duties of A. E. Witt, who has retired.

Horn, Mumaw Promoted By Wheeler Wire Co.

Wheeler Insulated Wire Co., Inc., Bridgeport, Conn., has promoted George B. Horn, former secretary and assistant general manager, to the position of vice president. George T. Mumaw, former treasurer, has been appointed secretary and treasurer.

Emil Greiner Moves Into New Building

Emil Greiner Co., manufacturers and distributors of scientific and industrial glassware, laboratory, and chemical supplies, has recently moved to its new nine-story building in New York City. The building is one of the most complete of its kind.

Coldwell Succeeds Towers

Ford, Bacon & Davis, Inc., engineers of New York, Philadelphia, Chicago, and Los Angeles, has elected E. S. Coldwell as president, succeeding James F. Towers, who will actively continue as chairman of the board of directors. Coldwell will at the same time succeed Towers as president of Ford, Bacon & Davis Construction Corp., Monroe, La., a wholly owned subsidiary.

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FOR SALE: Wilson Mogul Drilling Rig. Lee C. Moore 87′ Jackknife Derrick. Compound GAK Waukesha Motors. 6x16 Wilson Snyder Pump. Capable of drilling 5000 ft. Complete rig in good condition. Terms if desired. Blalack Drilling Company, Box 1145, Gladewater, Texas. Phone 324. Price $35,000.00.

FOR SALE: Two fully equipped 6NKU Waukesha Motors, one type D-20 Ideal 5 sheave traveling block, almost brand new 129 foot derrick with ten foot substructure. If interested write Harris Drilling Company, 525 Wichita National Bank Building, Wichita Falls, Texas.

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LARGE AND SMALL

All are truck mounted, rotary chain pull down, smallest pump size 3½ x 5 Some are in excellent condition, others need repairs. Price FOB Dallas from $2,000.00 to $8,000.00 including truck. For details write 8800 Lemmon Ave., Dallas 9, Texas.

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One Burroughs-Moons Hopkins PIPE LINE POSTING MACHINE. Serial No. 1506975. Bell Oil & Gas Company, Tulsa. Mr. Dyer or Mr. Anson.

FOR SALE: 1—21½" OD by 20′ Tulsa Type Gas Cooler, 600# Test through tubes, 250# Test around tubes. Fitted with 118 1", 10 Gauge Stainless Steel Tubes. $350. Cities Service Oil Co., Patridge, Bartlesville, Okla.

COUPLINGS—For Sale: 2", 3", 4", 6" and 8" Line 2" Reg. Tubing, 5½" OD x 8 Rd. and 11½ thd. Casing. Julius M. Fogelman, 1649 Perkiomen Ave., Reading, Pa.

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Three 8000′ capacity steam rigs complete with 129′ releg derricks and substructure, blowout preventers, drill pipe, and everything ready to put to work. Rigs located at or near Alice, Tex.

For further information, write

AL BUCHANAN DRILLING COMPANY
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or Frank Buchanan, c/o Al Buchanan Drilling Company, Box 1308, Alice, Texas

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FOR CABLE TOOLS
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PIPELINE Construction Equipment for Sale: Pipe cleaning machine with priming head, traveling or stationary, 6" to 12", excellent condition, $1,350. Two T40 International tractors with pipelayer attachments, good condition, very cheap. Contact C. W. Sternberg, 8250 Wier Drive, Houston, Texas. Phone Preston 7043.

FOR SALE: Near Burrton, Kansas, 1—18′ x 101′ x 35′ Fluor Atmospheric Cooling Tower Model 12-N with 4 wood water pans. Standing. Cities Service Oil, Patridge, Bartlesville, Okla.

FOR SALE: Wilson Mogul draw works powered by G.A.K. Waukesha engine. Good condition, priced for quick sale. Terms. Melton Supply Company, Seminole, Oklahoma

3,500′
NEW 5½" SEAMLESS
15½#—J55

Interested in some good drilling deal in Kansas or Oklahoma. Write fully. What have you? Box C-741, The Oil and Gas Journal, Tulsa, Oklahoma.

DIESELS, 2, 1600 HP, 2 cycle, Fairbanks-Morse opposed piston Model 38D-8⅛, 8⅛" x 10", 720 RPM. Surplus removed from LSM by us for installation in new towboat for major barge line. These engines have been completely overhauled by us under factory supervision and are offered for sale because boat project delayed. If you need quick power this is an excellent buy. Price is $35,000.00 each, f.o.b. cars Jeffersonville.

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Jeffersonville, Indiana

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3—375 KVA 60 cy 3 ph 440 volt Elliott Alternators direct-connected to Ingersoll-Rand 400 RPM gas engines. Complete with exciters & switchboards. Can be rewound for 2300 volts. Running and in operation at this time.

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Two RX1V Le Roi 8-Cylinder Engines; B-14 Emsco 7¼" x 14" Pump; Regan Traveling Block; SS-625 Ideco Swivel; 4125 B-J Hook; 27½" Oil Well Rotary; LR Thompson Shale Separator; Web Wilson Tongs; Kohler Light Plant; Water Tank; Tool House; Acetylene Welder; Overshot; Steel Pipe Racks; Mud Mixer; Measuring Reel; Drill Collar Clamp; Weight Indicator; Water Pump; Pipe Straightener; B-J Slip Casing Elevator; Drill Collars; Subs and Necessary Accessory Equipment. 6200′ **practically new 4½" Drill Pipe.** Inspect now to best advantage as rig is drilling on 4500′ Central Oklahoma well, on completion of which delivery can be made.

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OIL WELL SUPPLIES
TULSA, OKLAHOMA

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SAVE WITH SAFETY—Very Good Used Wire Line—Any Size or Length up to 5,000'—Respooled for Your Inspection—Cable Tools For Sale. General Tool & Supply Co., P.O. Box 4387, Phone 61335, Oklahoma City, Okla.

WELL drilling spudders, beams, light rotaries, core drills, tools, casing. Used equipment at money saving prices. Spang and Mills new tools. Leschen lines. Everything for well drilling. Pressey & Son, Pueblo, Colo.

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FOR SALE: At Eldorado, Kansas, 5000' of 4" B & S. Cast Iron Used Water Main, Class A, 12' and 16' lengths, 2500' 4" cast iron pipe 6' lengths, Universal bolted type, just reclaimed as oil purchase line. Empire Pipeline Company, Patridge, Bartlesville, Okla.

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10000' Used Grade C 7" OD 24 & 26# Seamless Oil Well Casing, 8 Rd. Thr., Long Coup., Range 2. Must be in good condition.

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WANTED: 3½" OD or 4½" OD used drill pipe, 3½" OD line pipe or tubing. SCHAFER PLOW, INC. Box 578, Pratt, Kansas. Atten.: J. L. Crowder.

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Am interested in purchasing good-second-hand, unit 15 rig, with either 2 or 3 motor compound. Please send description, price, and location to: Box C-732, The Oil and Gas Journal, Tulsa, Oklahoma.

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WANTED: Geologist for supervisory and administrative duties exploration and drilling project Middle East. Should have some experience in seismc and surface work. Age 30 to 45. Reply Box C-704, The Oil and Gas Journal, Tulsa, Oklahoma.

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GRADUATE GEOLOGIST, 10 years experience, six years supervisory capacity. Qualified for district or chief geologist. Central Texas and Rocky Mts. Box C-718, The Oil and Gas Journal, Tulsa, Oklahoma.

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TO LEASE for oil 640 acres Reagan County, Texas, 5 miles SW Styles, 3 miles north University Lands, quarter mile south Centerela on Middle Concher River at Big Rock. L. B. Dougal, 2001 Concourse, Bronx, New York.

WANT Development; Have Two Thousand acres offsetting flowing production, Central Texas. Best geology. Four possible producing horizons. Warrants Rigid Investigation. Don't answer unless mean business. P.O. Box 287, Eastland, Texas.

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PRODUCING OR NONPRODUCING
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Inquiries Invited
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1948 Texas Lease Revenue Doubles Previous Record

HOUSTON.—A record total of $40,099,396.68 was collected by the General Land Office of Texas for mineral leases during the year of 1948.

This figure is nearly double that of any previous year. The increase is attributed by Commissioner Bascom Giles to "development of tideland oil properties," and to "spirited open competition between all manner of oil men, both big and small" for leases on state school properties.

The money collected goes into the public school permanent fund and the state university fund. In 1900, Texas awarded the public schools of Texas all of its public domain existing at that time, some 42,500,000 acres. The university fund was established when some 2,300,000 acres of state land were set aside in 1876 and 1883 to assist higher education.

Tidelands lease money goes into the public school fund. Giles has predicted that their eventual worth in the next 10 years may reach one billion dollars. In connection with the tidelands, Giles said, "The State of Texas made a do-or-die stand in 1849 against the federal Government over a portion of its domain valued at only about ten million. The same right of property ownership is involved. The same interpretation of the treaty of annexation will give Texas undisputed claim to the submerged lands. It is the same fight all over again, except that the stake is higher."

Few Offers Made Armed Services Storage Plan

WASHINGTON. — Representatives of the armed services admitted this week that few offers are being received for storage facilities to be used in building an emergency reserve of petroleum products.

The idea of building up a reserve was put under way some weeks ago with the formation of a tankage committee representing the Army, Navy, and Air Force which has since been surveying the situation with a view to determining how much storage capacity might be secured.

There is no intention of building up a war reserve, which would require tremendous capacity, but rather to develop such reserves as might be needed to carry the military over any emergency or interim period. The size of the proposed reserve has not been determined, but will depend upon the amount of storage that can be secured.

One of the committee's chief purposes is to avoid competition between the services for scarce tankage, and it will serve as a clearing house and allocated available capacity on the basis of the storage needs presented to it by the three services.

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CALENDAR OF EVENTS

1949

January

Society of Automotive Engineers, fuels and lubricants, Engineering Societies Building, New York, January 27.

Western Petroleum Refiners Association, regional technical-industrial relations meeting, Washington-Youree Hotel, Shreveport, La., January 28.

February

Conference on Reservoir Engineering, University of Texas, Austin, Tex., February 8-10.

American Institute of Mining and Metallurgical Engineers, annual meeting, Fairmont Hotel, San Francisco, February 13-17.

American Society for Testing Materials, spring meeting and A.S.T.M. committee week, Hotel Edgewater Beach, Chicago, Ill., February 28-March 4.

March

American Petroleum Institute, Southwestern district, Galvez Hotel, Galveston, Tex., March 9-11.

American Association of Petroleum Geologists, regional meeting; Society of Exploration Geophysicists, and Society of Economic Paleontologists and Mineralogists, Jefferson Hotel, St. Louis, Mo., March 14-17.

American Petroleum Institute, division of production, Mid-Continent district meeting, Mayo Hotel, Tulsa, March 23-25.

New England Gas Association, Hotel Statler, Boston, March 24-25.

Western Petroleum Refiners Association, thirty- seventh annual meeting, Plaza Hotel, San Antonio, Tex., March 28-30.

American Chemical Society, division of petroleum chemistry, spring meeting San Francisco, March 27-April 1.

April

American Petroleum Institute, division of Refining, mid-year meeting, Shamrock Hotel, Houston, April 4-7.

American Society of Lubrication Engineers, annual meeting, Pennsylvania Hotel, New York, April 11-13.

National Association of Corrosion Engineers, annual convention, Netherlands Plaza Hotel, April 11-14, Cincinnati, Ohio.

Southwestern Gas Measurement Short Course, University of Oklahoma, College of Engineering, Norman, Okla., April 12-14.

National Petroleum Association, Hotel Cleveland, Cleveland, Ohio, April 13-15.

Natural Gasoline Association of America, annual meeting, Texas Hotel, Fort Worth, April 20-22.

Southern Gas Association, annual convention, Buena Vista Hotel, Biloxi, Miss., April 20-22.

Amercian Petroleum Institute, Eastern district, William Penn Hotel, Pittsburgh, Pa., April 27-29.

May

Independent Petroleum Association of America, midyear meeting, Roosevelt Hotel, New Orleans, La., May 3-4.

Oil-Heat Institute of America, annual convention, Boston, Mass., May 16-20.

Amercian Gas Association, natural-gas department, spring meeting, French Lick Springs Hotel, French Lick, Ind., May 9-10.

American Petroleum Institute, division of production, Pacific Coast district meeting, Biltmore Hotel, Los Angeles, Calif., May 12-13

Instrument Society of America, annual spring meeting, Royal York Hotel, Toronto, Canada, May 12-13.

Amercian Petroleum Institute, Rocky Mountain district, Gladstone Hotel, Casper, Wyo., May 26-27.

Natural Gas and Petroleum Association of Canada, annual meeting, Hotel London, London, Ont., Canada, May 26-27.

June

American Society for Testing Materials, fifty-second annual meeting, Hotel Chalfonte Haddon Hall, Atlantic City, N. J., June 17-July 1,

September

National Petroleum Association, Hotel Traymore, Atlantic City, N. J., September 14-16.

October

National Lubricating Grease Institute, Hotel Roosevelt, New Orleans, La., October 3-5.

American Gas Association, annual convention, Chicago, Ill., October 17-20.

NOMADS

Houston Nomads, second Monday of each month. The Houston Club, Houston.

Los Angeles Nomads, second Wednesday each month. Jonathan Club.

LEGAL

United States Department of the Interior, Warm Springs Agency, Warm Springs, Oregon. NOTICE is hereby given that sealed bids will be received until 2:00 o'clock p.m., February 1st, 1949, for oil and gas mining leases on three blocks of restricted Indian lands, comprising 5,083.59 acres, more or less, in Harney County, Oregon. The royalty rate will be 12½% and the annual rental $1.25 per acre. The leases are offered subject to acceptance of the bonus bids by the Indian leasors and approval by the Commissioner of Indian Affairs. The right is reserved by the Commissioner of Indian Affairs to reject any and all bids and to disapprove and reject prior to approval any lease made on an accepted bid. For legal description of all tracts offered, detailed terms of sale, lease forms, and bond requirements, write the Superintendent, Warm Springs Indian Agency, Warm Springs, Oregon.

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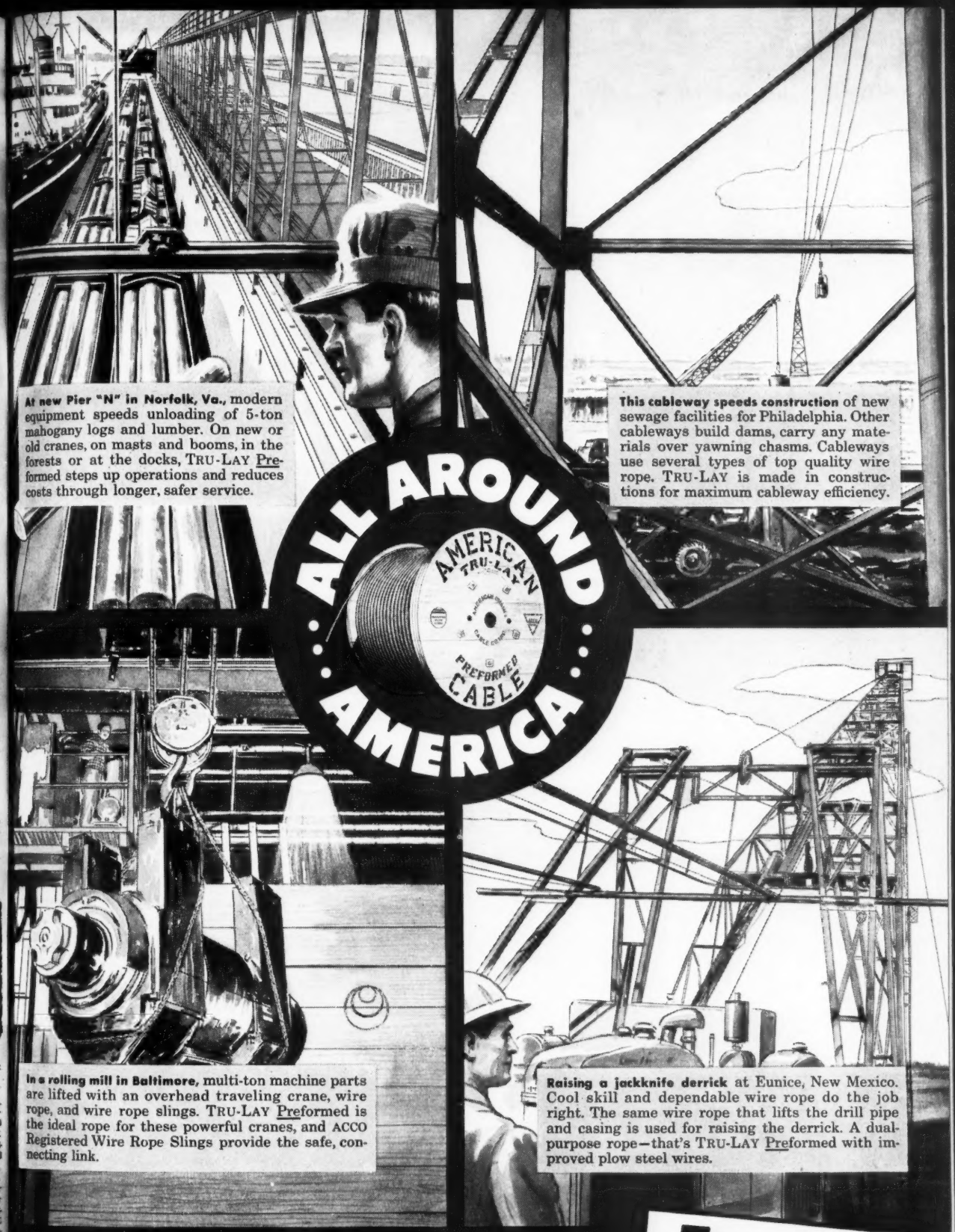

At new Pier "N" in Norfolk, Va., modern equipment speeds unloading of 5-ton mahogany logs and lumber. On new or old cranes, on masts and booms, in the forests or at the docks, TRU-LAY Preformed steps up operations and reduces costs through longer, safer service.

This cableway speeds construction of new sewage facilities for Philadelphia. Other cableways build dams, carry any materials over yawning chasms. Cableways use several types of top quality wire rope. TRU-LAY is made in constructions for maximum cableway efficiency.

In a rolling mill in Baltimore, multi-ton machine parts are lifted with an overhead traveling crane, wire rope, and wire rope slings. TRU-LAY Preformed is the ideal rope for these powerful cranes, and ACCO Registered Wire Rope Slings provide the safe, connecting link.

Raising a jackknife derrick at Eunice, New Mexico. Cool skill and dependable wire rope do the job right. The same wire rope that lifts the drill pipe and casing is used for raising the derrick. A dual-purpose rope—that's TRU-LAY Preformed with improved plow steel wires.

Tru-Lay *Preformed* **Wire Rope**

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